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SWAN CREEK WATERSHED

FINAL ENVIRONMENTAL IMPACT STATEMENT

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Swan Creek Watershed, Limestone County, Alabama

FINAL ENVIRONMENTAL STATEMENT

William B. Lingle
State Conservationist
Soil Conservation Service

Sponsoring Local Organizations

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Route 1
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Swan Creek Watershed Conservancy District
Hoyt E. Williamson, Chairman
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June 1974

Prepared By

U. S. DEPARTMENT OF AGRICULTURE

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USDA ENVIRONMENTAL STATEMENT
Swan Creek Watershed
Limestone County, Alabama
Prepared in Accordance With
Sec. 102(2) (C) of P. L. 91-190

Summary Sheet

- I. Draft () Final (X)
- II. Soil Conservation Service
- III. Administrative (X)
- IV. Description of Action: The Swan Creek Watershed project is a watershed protection and flood prevention proposal to be carried out by the local sponsoring organizations. Federal assistance will be provided under the provisions of Public Law 566 in accordance with a work plan for Swan Creek Watershed in Limestone County, Alabama. The project includes conservation land treatment measures and channel work. The purpose of the project is to reduce flood damages and conserve and enhance the natural resources.
- V. Summary of Environmental Impact and Adverse Environmental Effects:

The proposed conservation land treatment measures will reduce erosion on the uplands and sedimentation downstream. Channel work will reduce floodwater damages by about 73 percent. A reduction in flood damages will allow more intensive farming and changed land use practices thereby increasing income and promoting better land use.

The project will provide 25 man-years of employment during the installation period. This employment along with increased agriculture incomes brought about by a reduction in flooding will promote a higher standard of living.

Some fish and wildlife habitat will be adversely affected by increased stream turbidity and sedimentation during construction. Wildlife food and cover will be reduced with the clearing of approximately 300 acres of forest land for project installation. This land will be reforested except for 78 acres which will be occupied by the proposed channel.

VI. Alternatives Considered During Project Development:

1. Conservation land treatment alone.
2. Conservation land treatment, flood plain zoning and flood insurance.
3. Conservation land treatment and floodwater retarding structures.
4. Conservation land treatment and a floodway system.
5. Conservation land treatment and a dike system.
6. Conservation land treatment and selective clearing and snagging.

CHAPTER

The first part of the book is devoted to a general survey of the subject. It begins with a definition of the term, and then proceeds to a discussion of its history and development. The author then turns to a consideration of the various methods of study, and finally to a summary of the results of the research.

The second part of the book is devoted to a detailed examination of the various methods of study. It begins with a discussion of the methods of observation, and then proceeds to a consideration of the methods of experiment, and finally to a summary of the results of the research.

The third part of the book is devoted to a detailed examination of the various methods of study. It begins with a discussion of the methods of observation, and then proceeds to a consideration of the methods of experiment, and finally to a summary of the results of the research.

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VII. Agencies, Groups and Individuals from Which Written Comments Were Received:

1. Department of Health, Education, and Welfare
2. Department of the Interior
3. Environmental Protection Agency
4. Tennessee Valley Authority
5. Appalachian Regional Commission
6. Alabama Development Office
 - Soil and Water Conservation Committee
 - Alabama Department of Conservation and Natural Resources
 - Environmental Health Administration
 - Alabama Water Improvement Commission
7. Alabama Wildlife Federation
8. Alabama Sportsman Conservation Club
9. The Alabama Conservancy - Birmingham, Alabama
10. The Alabama Conservancy - Huntsville, Alabama
11. Bradley, Arant, Rose and White, Attorneys, Birmingham, Alabama
12. Citizens to Save Swan Creek
13. Sierra Club
14. Bob Truett, Individual, Birmingham, Alabama
15. Richard K. Smith, Individual, Birmingham, Alabama

Notification of "No Comment" was received by telephone from U. S. Army Corps of Engineers and Department of Commerce.

VIII. The Final Statement was transmitted to CEQ on July 3, 1974.

The Draft Statement was received by CEQ on February 6, 1973.

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USDA SOIL CONSERVATION SERVICE ENVIRONMENTAL STATEMENT

Title of Statement: The Swan Creek Watershed Project, Limestone County, Alabama.

Type of Statement: Draft () Final (X)

Date:

Type of Action: Administrative (X)

Statement:

1. Description:

Authority for Project: Federal assistance through P. L. 566, 83rd Congress, 68 Stat. 666, as amended.

Sponsoring Local Organizations: Limestone County Soil and Water Conservation District; Swan Creek Watershed Conservancy District; Limestone County Commission.

Purpose of Project: The project will provide watershed protection and flood prevention to the Swan Creek Watershed.

Project Measures: The project plan provides for conservation land treatment measures and about 12.5 miles of channel work.

ENVIRONMENTAL SETTING

PHYSICAL DATA

The Swan Creek Watershed is located in central Limestone County in north central Alabama.¹ It lies within the Southern Appalachian Ridges and Valleys Land Resource Area and is also included in the Tennessee Valley Resource Conservation and Development (RC&D) Project Area. The

¹All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigation by the Soil Conservation Service, U. S. Department of Agriculture.

watershed has a drainage area of approximately 56,429 acres, about 16 percent of Limestone County, and is part of the Tennessee River Basin.

The watershed is located approximately 13 miles due north of Decatur, Alabama, (population 38,044), and 25 miles west of Huntsville, Alabama, (population 137,800). The city of Athens is located in the watershed.

Swan Creek originates in north central Limestone County near the community of Hays Mill. It flows in a southerly direction until it empties into Wheeler Reservoir on the Tennessee River. Approximately five miles of Swan Creek flows through the eastern portion of the city limits of Athens, (See Appendix C). Other major streams in the watershed are Muddy Creek, Town Creek, Spring Creek, Mud Creek, and Briley Creek.

The average annual rainfall in this area is 51 inches. Short periods of very dry or very wet weather are common. Dry conditions prevail from mid-summer to late fall, but severe droughts over long periods are unusual. The driest month is October, with a mean precipitation of 2.57 inches. January is the wettest month, with a mean precipitation of 5.70 inches. The length of the growing season is approximately 200 days, with the last killing frost occurring in April and the first occurring in October. The mean annual temperature is 62.6 degrees Fahrenheit, with the monthly averages ranging from 43.9 degrees in January to 80.9 degrees.¹

Major soils on the upland areas occur in capability class and subclass IIe, IIIe, and IVe. Predominant upland soils are: (1) Decatur silt loam, (2) Dickson silt loam, and (3) Dewey silt loam, and are briefly described as follows:

UPLAND SOILS

- (1) Decatur - This series consists of level to strongly sloping soils of the limestone valleys. This soil has dark reddish brown silt loam to silty clay loam surfaces and dark red clay subsoils. The regolith is old valley fill material and residuum from limestone. Slopes generally are from 1 to 10 percent but range to 25 percent.
- (2) Dickson - Gently to moderately sloping broad ridges and plateau-like areas. Slopes range from 1 to 10 percent. The soil formed in 2

¹U. S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatological Data, Annual Summaries.

to 4 feet of a silty mantle underlain by residuum weathered from cherty and clayey limestone or old alluvium. Soils are moderately well drained with slow runoff and moderately slow permeability.

- (3) Dewey - This series consists of deep, well drained soils on limestone uplands. These soils have a dark reddish brown silt loam surface layer about 6 inches thick and a red to dark red clay subsoil. Slopes vary from 2 or 30 percent. Some areas are pitted with limestone sinks.

Soils in the flood plain are mainly silt loams in capability classes and subclass IIw, IIIw, and IVw. Flood plain soils by order of predominance are: (1) Lobeville cherty silt loam, (2) Lee silt loam, and (3) Ennis silt loam, and are briefly described as follows:¹

FLOOD PLAIN SOILS

- (1) Lobeville - Lobeville soils are on bottom lands and in depressions. Slopes are commonly less than 3 percent. The soils formed in loamy alluvium washed from soils formed in material weathered from limestone, shale, sandstone, and loess. These soils are moderately well drained. Runoff is slow and permeability is moderate. Many low lying areas flood occasionally.
- (2) Lee - This series consists of poorly drained strongly acid soils on nearly level bottom lands and in depressions. These soils have dark grayish brown cherty silt loam surface layers and gray mottled cherty silt loam subsoils. Soils are severely limited in use because of frequent flooding.
- (3) Ennis - This soil is found on bottom lands along creeks and streams. Slopes range from 0 to 2 percent. Drainage is fair to good except for an occasional overflow. To a depth of about 8 inches this soils is brown to yellowish brown friable silt loam. Parent material is limestone and cherty limestone.

¹U. S. Department of Agriculture, Soil Survey of Limestone County, AL, (March 1953), and Soil Survey Interpretations, Various dates, Auburn, AL.

CAPABILITY CLASS AND SUBCLASS

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Subclass "e" soils are limited in use because of erosion hazard.

Subclass "w" soils are limited in use because of wetness or drainage problems.

The topography of the watershed ranges from gently sloping to steep. The flood plain occupies most of the level land. Elevations range from 560 to 800 feet above sea level.

Mineral resources are fair to poor in quantity. Most of Limestone County is directly underlain by limestones. High calcium limestone does not occur in significant amounts to be of commercial value but limestone suitable for road material is abundant. Most limestones occur in the Warsaw and Chickamauga geologic formations. The Chattanooga Shale is fairly abundant in the area but has no immediate economic value.¹ Based on discussions with representatives from the Geological Survey of Alabama it is the opinion that the economic value is due primarily to a low uranium content and an estimated 300 foot overburden.

Ground water in the area occurs primarily in Fort Payne Chert. It occurs in weathered, porous zones from which the calcareous material has been leached, leaving an open skeletal network of chert.² Ground water is abundant and of good quality but is moderately hard.

Current land use in the watershed is as follows:

Land Use	Acres	Percent
Cropland	27,373	48
Pastureland	12,510	22
Forest Land	11,066	20
Miscellaneous or Idle	5,480	10
TOTAL	56,429	100

¹Geological Survey of Alabama, Circular 46, The Geology and Mineral Resources of Limestone County, Alabama, by T. W. Daniel, Jr., and E. L. Hastings, University, Alabama, 1968.

²Geological Survey of Alabama, Information Series 23, Interim Report on Ground Water Studies in the Athens Area, Alabama, William M. McMaster, University, Alabama, 1960.

Major row crops produced in the watershed are cotton, soybeans, and corn. The flood problem area consists of approximately 2,658 acres. Land use in this area is as follows:

Land Use	Acres	Percent
Cropland	611	23
Pastureland	1,143	43
Forest Land	851	32
Miscellaneous or Idle	53	2
TOTAL	2,658	100

The present forest land watershed cover conditions are classed as 6 percent poor and 94 percent very poor. This results principally from overcutting, wildfires, and past cultivation of lands that are now forested.

The forest types are pine, 15 percent; pine-hardwood, 5 percent; hardwood-pine, 11 percent; and hardwood, 69 percent. Principal species are loblolly pine, red oak, white oak, hickory, yellow poplar, water oak, willow oak, sweetgum, dogwood, and blackjack oak.

Seventy-two percent of the forest area is well stocked with merchantable tree species. Total sawtimber volume will average 950 board feet of pine and 1,700 board feet of hardwood per acre. This compares to an average forested acre volume of 1,710 board feet of pine and 1,200 board feet of hardwood in Tuscaloosa County, Alabama,¹ which has some of the better stocked forests in north Alabama.

There are no watershed lands administered by the U. S. Forest Service. Most of the forest land is in small private ownerships.

The Alabama Division of Forestry, in cooperation with the U. S. Forest Service through the various federal-state cooperative forestry programs, is providing forest management assistance, forest fire prevention and suppression, distribution of planting stock, and forest pest control assistance to private landowners in the watershed.

Most pastures, especially those on bottom land soils, are established to fescue and white clover. Some Coastal bermudagrass pastures are established on the uplands.

Swan Creek receives, by way of Town Creek, an effluent of about two million gallons/day (MGD) from the secondary sewage treatment plant and

¹U. S. Forest Service, Resource Bulletin SO-39, Forest Statistics for Alabama Counties, 1973.

storm sewer discharge from Athens, Alabama. Water quality for any purpose is noticeably reduced from the confluence of Town Creek to the Wheeler Reservoir, primarily due to this discharge. The City of Athens is presently building a new secondary sewage treatment plant, which is expected to be operational by early 1975, that will alleviate some of this pollution problem.

The Swan Creek stream system was classified according to streamflow and channel type. Stream systems with less than one square mile drainage area were not classified. The classification revealed that 59.5 miles of the stream system flows perennially. About 14 miles of the perennial stream channels have been previously modified by man. Approximately two miles of the stream system in the upper reach flows intermittently. About 0.9 mile of the intermittent stream has a man-made or previously modified channel. Average streamflow at the lower end of Swan Creek is 95 cubic feet per second (cfs) or 60.6 MGD. The low flow discharge during the evaluation period (1944-1963) was 0.66 cfs or 0.43 MGD. The maximum peak discharge recorded during the evaluation period was 12,400 cfs or 8,114 MGD.

The flow condition of the 12.5 miles of Swan Creek planned for channel work is perennial, (See Appendix C.) Approximately 0.8 mile of this portion of the stream has been previously modified by man. The present flow condition is obstructed by trees, tree tops and other debris. The capacity of the stream channel to carry flood flows is limited due to the obstructions. Also, the obstructions create turbulence which results in sloughing of channel banks.

Swan Creek is classified from its source to the Tennessee River as having a potential for fish and wildlife resource and Town Creek, a tributary of Swan Creek, is classified for treated waste transportation.¹

A recent sampling shows stream discharge ranging from 54 cfs to 219 cfs in the lower end of the stream.² The sampling indicated stream temperature ranging from 6.5 degrees to 23.0 degrees centigrade. Other concentrations in milligrams per liter (mg/l) ranged from: (NH₃), 0.05 to 3.20; (NO₃), 0.21 to 1.47; phosphate, 0.12 to 5.60; (DO)*, 0.0 to 11.1; (BOD)**, 1.1 to 6.5; (CaCO₃), 19 to 83. Coliforms vary from 1,800/100 ml to 2,200,000/100 ml.

¹Alabama Water Improvement Commission, Classification of Intrastate Waters of the Tennessee River Basin, June 19, 1967.

²Tennessee Valley Authority, Division of Health and Safety, Comprehensive Plan for Water Quality Management in the Tennessee Valley, Volume II, 1969.

*Dissolved oxygen

**Biological oxygen demand

Wetlands, as defined by the U. S. Department of Interior, Fish and Wildlife Service, Circular 39¹, are not known to exist in the watershed.

ECONOMIC DATA

The Tennessee Valley Authority owns approximately 2,400 acres in the lower portion of the watershed adjacent to the Wheeler Reservoir and about 40 acres adjacent to Swan Creek in the northeastern portion of the City of Athens. The 2,400 acres are a part of the Swan Creek Wildlife Management Area managed by the Alabama Department of Conservation and Natural Resources. The City of Athens owns scattered acreages within the watershed. The remaining land within the watershed is in private ownership.

The economy of the watershed is basically dependent upon agriculture and related industries. The major farm enterprises are row crops and beef cattle production. Row crops are predominantly cotton, soybeans, and corn. Other farm enterprises within the watershed are beef and hog production, and hay crops.

There are approximately 450 landowners within the watershed, excluding urban areas. Farm sizes range from about 20 to 800 acres per farm. The average size farm is about 120 acres. Many of the farms are small family-type units where the proprietor is engaged in both farm and off-farm employment. According to 1969 census data, 79 percent of Limestone County farms had annual gross sales of less than \$5,000.² Swan Creek Watershed farms are typical of other farms in Limestone County.

Estimated present crop yields in the upland and flood plain areas by predominant soils are as follows:

Soil	UPLAND AREAS			
	Present Yield/Acre			
	Soybeans	Cotton	Corn	Pasture
Decatur	34 bu.	750 lb.	68 bu.	7.5 AUM*
Dickson	21 bu.	525 lb.	53 bu.	5.5 AUM
Dewey	34 bu.	675 lb.	60 bu.	6.8 AUM

*AUM-animal unit month (one 1,000 lb. cow and a nursing calf grazing for one month)

¹U. S. Department of Interior, Fish and Wildlife Service, Wetlands of the United States, Circular No. 39, 1956.

²U. S. Department of Commerce, Bureau of the Census, 1969 Census of Agriculture.

FLOOD PLAIN AREAS				
Soil	Present Yield/Acre			
	Soybeans	Cotton	Corn	Pasture
Lobeville	25 bu.	600 lb.	60 bu.	7.0 AUM*
Lee	15 bu.	---	30 bu.	5.5 AUM
Ennis	25 bu.	700 lb.	70 bu.	7.0 AUM

*AUM-animal unit month (one 1,000 lb. cow and a nursing calf grazing for one month)

Estimated land values in the upland areas range from \$500 to \$800 per acre. The estimated flood plain land values range from \$500 to \$700 per acre. Land values have increased sharply in recent years because of rapid industrial development and expanding population of Huntsville and Decatur, Alabama. The estimated value of urban land in the watershed ranges from \$8,000 to \$12,000 per acre.

The watershed is spanned by highways, paved county roads, and field roads. U. S. Highways 31 and 72, State Highways 127 and 208, and county roads provide routes through the watershed. The Louisville and Nashville Railroad (L&N) provides rail service to Athens.

Limestone County had a population of about 42,000 in 1970. Between 1960 and 1970 the population increased by 14.2 percent.¹ Approximately 65 percent of the population is rural. The population of Athens, Alabama has increased about 54 percent in the past 10 years. This rapid increase is due primarily to employment created by industrial development in Huntsville and Decatur. Present residential developments to accomodate this increasing population have encroached into the Swan Creek flood plain. The Brown's Ferry nuclear plant, presently under construction in the southwest portion of Limestone County, will contribute to a further increase in population.

Limestone County has a total work force of 16,900 with about 4.7 percent unemployment. The leading sources of employment are: food processing, textile and apparel, instrument manufacturing, and agriculture.²

FISH AND WILDLIFE RESOURCES

The fishery resource is best in the extreme lower reach of Swan Creek. The portion of the stream below the L&N Railroad, in the lower extremity of the watershed, and above Wheeler Reservoir supports about 100

¹U. S. Department of Commerce, Bureau of the Census, Population Estimates and Projections, June 28, 1971.

²Alabama State Employment Service.

man-days of sport fishing per surface acre annually. That portion of Swan Creek above the L&N Railroad currently provides less than five man-days of sport fishing per surface acre annually. The lower portion of Swan Creek and receiving embayment in Wheeler Reservoir represents one of the major nursery areas for the Wheeler Reservoir fisheries.¹ The percentage of the total reservoir fishery reproduction contributed by these areas is not known.

"White and yellow bass, generally considered creek spawners, may spawn on shoal areas in Swan Creek as indicated by occurrence of larvae in shoreline meter-net samples taken in the embayment. Forage species, i.e., shad, carp, minnows, drum, and suckers, are known to seek out slow-moving backwaters such as the Swan Creek embayment for spawning habitat and/or nursery areas".²

The principal fish species below the southernmost crossing of Highway 31 are bass (largemouth and white), bluegill, catfish (channel, blue, flathead, and bullhead), longear sunfish, crappie, and warmouth bass. Above this point, the principal species are catfish, suckers, and sunfish.

Pollution from the City of Athens severely limits water quality in Swan Creek, below its confluence with Town Creek, for fish habitat. Sports fishery is low in this area primarily due to pollution. Above Town Creek, fish habitat values are low because of shallow flow.

Game resources are low to moderate in number. Deer and turkey populations in the watershed are negligible and potential habitat is limited. Squirrel and rabbit populations are low except in the extreme lower reach. Ducks winter in wooded areas along the streams in the lower reaches of the watershed. Doves are fairly abundant during the fall and winter in the corn fields of the watershed. Furbearer populations are moderate.

Forest land cover adjacent to the stream in the upper portion of the watershed ranges from 50 to 800 feet in width. Streambank vegetation is predominately hardwoods, such as oak, beech, hackberry, sycamore, hickory, sweetgum, poplar, sourwood, and ironwood.

Information on wildlife as a hunting resource on private lands in this area is very limited; however, the following information was obtained from the Department of Conservation and Natural Resources for the Swan Creek Wildlife Management Area (6,242 acres; 2,400 acres of which are in the watershed).

¹Letter from Mr. Thomas H. Ripley, Director, Division of Forestry, Fisheries and Wildlife Development, Tennessee Valley Authority, to Mr. W. B. Lingle, June 15, 1973.

²Ibid., June 15, 1973.

HUNTING EFFORT 1970-71, 1971-2 ¹				
Game	Man-Days Hunted		Total Kill	
	1970-71	1971-72	1970-71	1971-72
Squirrel	710	295	177	147
Quail	600	360	749	441
Dove	2,325	2,405	7,281	8,035
Waterfowl*	11,285	7,750	6,008	5,313
Rabbit	740	467	487	273
Opossum & Raccoon	95	38	30	10

TRAPPING EFFORT 1970-71, 1971-72		
Game	Total Catch	
	1970-71	1971-72
Musckrat	160	35
Raccoon	20	--
Mink	34	10
Opossum	75	30
Fox	14	4

Recently the State of Alabama published a list of rare and endangered vertebrates.² The following lists of vertebrates may be breeding (B) or seasonally transient (T) residents of Swan Creek Watershed.

Rare

Tuscumbia darter - Etheostoma tuscumbia (B)
 Big eye shiner - Notropis boops (B)
 Southeastern shrew - Sorex l. longirostris (B)
 Bewick's wren - Thryomanes bewickii (B)
 Sharp-skinned hawk - Accipiter striatus velox (B)
 Cooper's hawk - Accipiter cooperii (B)

Endangered

Bald eagle - Haliaeetus l. leucocephalus (T)
 Osprey - Pandion haliaetus carolinensis (B)
 American peregrine falcon - Falco peregrinus anatum (T)

¹Alabama Department of Conservation and Natural Resources, Fish and Game Division, Montgomery, Alabama.

²Alabama Department of Conservation and Natural Resources, Rare and Endangered Vertebrates of Alabama, June 1972.

*Represents combined figures for Swan Creek and Mallard Fox Creek Wildlife Management Areas.

Status Undetermined

Flame chub - Hemitrema flammea (B)

Pygmy sunfish - Elassoma sp. (probably extinct)

Hellbender - Cryptobranchus a. alleganiensis (B)

RECREATIONAL RESOURCES

About 35 privately owned fish ponds presently exist within the watershed. These are private ponds that furnish a fishery resource for use by the owners. The Swan Creek Wildlife Management Area extends into the watershed and lies adjacent to the Wheeler Reservoir. Hunting in the Management Area is by permit only. A small number of the available hunters are chosen by lottery.

The Wheeler Reservoir and National Wildlife Refuge, covering about 67,000 and 35,000 acres respectively, provide fishing, and water-based recreational activities for people in the surrounding areas. The Wheeler National Wildlife Refuge is managed by the Bureau of Sport Fisheries and Wildlife. At the present time no waterfowl shooting is permitted.

According to the "Appraisal of Potential for Outdoor Recreation Development for Limestone County", there are three potential sites for recreational water storage in the Swan Creek stream system.¹ These impoundments would create approximately 135 total surface acres of water. This water could be used for water-based recreational activities and would attract some waterfowl. The appraisal also indicated a moderate potential for transient camping along U. S. Highways 31 and 72. There is some potential for waterfowl hunting in the watershed because of its location in regard to the reservoir and refuge.

ARCHAEOLOGICAL AND HISTORICAL VALUES AND UNIQUE SCENIC AREAS

The National Register of Historical Places does not list any historical sites within the watershed. The University of Alabama, Museum of Natural History has no knowledge of any historical or archaeological sites of value within the watershed.²

¹U. S. Department of Agriculture, Soil Conservation Service, An Appraisal of Potential for Outdoor Recreational Development, Limestone County, August 1971.

²Letter from David L. DeJarnette, Curator, The University of Alabama, Museum of Natural History, to W. B. Lingle, State Conservationist, Soil Conservation Service, July 17, 1973.

SOIL, WATER, AND PLANT MANAGEMENT STATUS

The 1969 Census of Agriculture data shows a 17 percent increase in total cropland in Limestone County over 1964 census data. Soybean acreage increased by about 600 percent while cotton acreage decreased by about 12 percent. Since 1969, cotton acreage has increased as allotments were bought or leased from other counties. Cropland used only for pasture or grazing increased by 43 percent and woodland increased by about 1 percent. Total land in farms increased by about 9 percent. Limestone County data was used to illustrate trends in land use since this data was not available for the watershed.

Pastureland and cropland in the flood plain are not managed for maximum productivity. The flood hazard prevents intensive farming and pasture management practices. This results in reduced production and inefficient use of resources.

Future potential yields without the project in the flood plain area are as follows:

FLOOD PLAIN AREA				
Soil	Soybeans	Cotton	Corn	Pasture
Lobeville	30 bu.	700 lb.	75 bu.	9.0 AUM
Lee	25 bu.	---	60 bu.	7.0 AUM
Ennis	35 bu.	800 lb.	100 bu.	9.0 AUM

Technical assistance in planning and applying soil and water conservation measures is provided by the Soil Conservation Service through the Limestone County Soil and Water Conservation District, (hereafter referred to as Limestone County S&WCD). For more information as to legal authority see the "Soil Conservation Districts Law of Alabama", Code 1940, Title 2 - Chapter 6 - Section 658-670, by 1949 legislature, on file in any Alabama courthouse.

There are 174 cooperators* with the Limestone County S&WCD, representing about 54 percent of the rural watershed area. About 70 percent of the planned conservation land treatment measures have presently been applied.

*

A landuser who has entered into a cooperative agreement with a soil and water conservation district to work together in planning and applying soil and water conservation measures.

Technical assistance is also available to the landuser even though they may not have entered into a cooperative agreement with the S&WCD. The necessary technical assistance will be provided on request by the Soil Conservation Service.

WATER AND RELATED LAND RESOURCE PROBLEMS

LAND AND WATER MANAGEMENT

Most erosion damage in the uplands occurs primarily during periods of land preparation or harvest when the land has less vegetative cover. This damage is in the form of rill erosion. Flood plain erosion is caused by floodwaters producing out-of-bank flow and scouring the soil, thus termed "scour" damage. This damage only occurs during the larger floods and is not a major problem.

An estimated 85 percent of cropland in tillage rotation in Limestone County (130,988 acres) needs some form of conservation land treatment measure. Approximately 62 percent of all pastureland in the county (74,560 acres) needs conservation land treatment.¹ Without adequate land treatment these lands are used beyond their capabilities and are being depleted each year in terms of productivity.

Almost half of the flood plain land is in pasture. These pastures are poorly managed because of the flooding problem. Most of the pastureland, within the flood plain, needs to be renovated and managed (tilled, limed, fertilized, and reseeded), to increase beef production, reduce erosion, and improve the water holding capacity of the soil.

FLOODWATER DAMAGE

Swan Creek is a small, meandering stream that has become choked by logs, brush, and sediment. The channel capacity is inadequate to carry the flood flows of even the smaller storms of the watershed. Flooding is the major problem in the watershed.

Landowners within the flood plain have been experiencing floodwater damages for many years. Damaging floods have caused a decrease in quality and quantity of crops produced and, in some years, crops have been lost entirely. Fixed improvements, such as fences and cattle gaps, are damaged or destroyed every year.

Flood damages occur on Town Creek east of the L&N Railroad and west of U. S. Highway 31. This is primarily due to the limited capacity of Swan Creek.

¹U. S. Department of Agriculture, Soil Conservation Service, Conservation Needs Inventory, Table 6 & 8, June 1970.

Recent urban developments, both residential and commercial, have encroached into the flood hazard areas increasing potential flood damages. At the present time the flood hazard area within the city limits of Athens is zoned for residential and commercial development.

Flood damages to roads and bridges have caused roads to be impassable. Road fills and culverts are often damaged by floodwaters causing additional expense for road maintenance and safety hazard to motorists.

The Swan Creek flood plain affected by the planned project consists of 2,658 acres, the area that is expected to flood on the average of once every 100 years. (It is represented by the yellow area in Appendix C.) Damaging floods occur to portions of this area on the average of four times a year during the cropping season (May - November) and three times a year during the remainder of the year based on Climatological data.¹ The average annual area flooded is estimated to be 7,709 acres. This figure is an accumulation of the number of acres flooded by flood events during the year and averaged for the evaluation period for the project from 1944-63. Some acres will receive repeated flooding and were counted each time they flooded. There are approximately 48 landowners within the flood plain area who receive varying degrees of floodwater damage annually.

Floodwater damages reduce the quality and/or quantity of agricultural crops by:

1. Causing delayed or repeated planting.
2. Causing untimely or delayed cultivation practices.
3. Delaying harvest into the wetter months of January and February thereby virtually terminating harvest on some of the lower areas. This is not a serious problem but has occurred on some farms in the watershed.
4. Reducing or eliminating pasture management techniques such as fertilization or controlled grazing.

Floodwater damages to crops and pastures average an estimated \$30,135 annually. Damages to fixed improvements such as fences and farm buildings average \$14,950 annually. Road and bridge

¹ U. S. Department of Commerce, Weather Bureau, Climatological Data, 1944-63.

damages average \$490 and indirect damages average \$4,383 annually. (Indirect damages result when a flood causes interruption in the feeding regimen of a livestock producer resulting in a slowdown in the rate of gain creating additional expenses before the livestock are marketable. Also when a bridge is washed out traffic is forced to detour at an added expense to the motorists.) Total average annual flood damages are estimated to be \$49,958.

Floodwater damage estimates were based on an evaluation of the floods that occurred during the period from 1944-63 and interviews with local residents.

SEDIMENT DAMAGE

Sediment damage within Swan Creek Watershed occurs during periods of flooding when fine-grained sediment is deposited on crops, pasture grasses, and in stream channels. This type of sediment damage is a part of floodwater damage and was evaluated as part of total flood damages.

Sediment transported by Swan Creek enters the backwater of Wheeler Reservoir and adds to sediment deposition and turbidity in the Tennessee River system. The estimated average annual sediment yield at the mouth of Swan Creek is 110,250 tons. Based on the texture of material entering Swan Creek, about 20 percent of the total sediment is sand and gravel sized material and 80 percent is silt and clay sized material.

The average annual suspended sediment concentration of Swan Creek at its mouth is about 600 milligrams per liter (mg/l). Sediment concentrations in this range do not usually harm adult fish. The Environmental Protection Agency, however, has indicated that, "only poor fisheries are likely to be found in waters which normally contain more than 400 mg/l suspended solids".¹ The fine-grained sediment, upon entering Wheeler Reservoir, spreads a thin deposit over large areas damaging aquatic vegetation, benthos and fish spawning grounds. This also occurs within the stream causing similar-type damages.

RECREATION

The water quality of Swan Creek, below its confluence with Town Creek, is very poor primarily because of pollution from the City

¹ Mackenthun, K. M., The Practice of Water Pollution Biology: U. S. Department of the Interior, Federal Water Pollution Control Administration, p. 33, 1969.

of Athens. The creek is unusable for water contact type recreational activities as a result of this pollution. (The Alabama Water Improvement Commission did not classify Swan Creek for swimming.)

Wheeler Reservoir provides water-based recreational activities and is available to all watershed occupants and residents in the area.

FISH AND WILDLIFE

Urbanization and increasing land values have had an influence on fish and wildlife resources throughout the watershed. The increased intensive use of the land has reduced the quality and quantity of fish and wildlife habitat. Stream fishery values are low largely because of pollution from Athens, Alabama. There is a need for planned management of both fish and wildlife resources on private lands in the watershed.

ECONOMIC AND SOCIAL

Limestone County is located within the Appalachian Region. The Appalachian Regional Development Act of 1965 was passed to provide the basic facilities essential for initiating and supporting accelerated economic development within the Appalachian Region. Its purpose is to close the economic gap with other progressive sections of the country.

PLANNED PROJECT

LAND TREATMENT

Land treatment measures were the first increment considered in planning the watershed project. Their installation is essential to the proper functioning of the project and meeting the needs in the watershed. All land treatment measures are planned for installation on privately owned land and will be paid for by the individual landowners in the watershed. Technical assistance in applying these measures will be provided by the Soil Conservation Service through the Limestone County S&WCD.

Farmers in the watershed will be urged by the Limestone County S&WCD to utilize good conservation management practices. Proper application of fertilizers, pesticides, and other chemicals will be stressed so as to minimize stream pollution. Conservation plans developed on watershed lands will emphasize the importance of using land within its capabilities and treating it according to its needs.

Conservation land treatment measures will be installed to adequately treat approximately 16,000 acres of cropland and 10,000 acres of pastureland by individual landowners. The measures will provide an effective conservation program in protecting the soil resource base in the watershed. Determination of the needed measures was based on the use of the land and its capabilities. The principal types of land treatment measures to be installed include terraces, grassed waterways, surface field ditches, conservation cropping systems, farm ponds, field borders, pasture and hayland planting, and crop residue management, (See Appendix E).

Terraces, field borders, and grassed waterways will be installed to control runoff, reduce sheet erosion, and provide adequate water disposal systems for the cultivated uplands of the watershed. Cropland which is being used beyond its capability for sustained agricultural production will be converted to pastureland. Trees will be planted on land which is more suitable for tree production than other uses. Existing pastureland will be renovated by over-planting and fertilizing to provide more effective cover which will reduce runoff and erosion. Drainage field ditches and diversions will be installed to provide effective means of controlling erosion and removing runoff from hill lands and small tributary areas.

A concerted effort by the Limestone County S&WCD, through an information program, will be made to interest cooperators in land treatment measures to develop habitat for fish, waterfowl, and farm game (bobwhite, dove, rabbit, and squirrel) for income-producing recreation or for home-use hunting and fishing.

The following forest land treatment measures have been developed from a study of land treatment needs. These are the results of consultations by the Alabama Forestry Commission and the U. S. Forest Service, following a field survey of the watershed, and from land use recommendations by the Soil Conservation Service:

(1) Tree Planting - Noncritical Area (650 Acres)

Reforestation of 650 acres of appropriate open land and understocked stands is necessary to adjust land use capability and reduce runoff and erosion by developing a protective cover and an absorbent forest floor of a spongy humus layer under a protective layer of litter.

(2) Stand Improvement Measures (2,460 Acres)

These operations are aimed at improving hydrologic conditions by manipulation of stand composition to create favorable conditions for the maximum production and protection of litter, humus, and forest cover. They include the removal of inferior species and cull trees, release, improvement, and harvest cuttings.

(3) Cooperative Fire Control (11,000 Acres)

Additional equipment consisting of a three-fourth ton truck equipped with a water tank and a two-way radio will help strengthen the existing fire control program in the watershed.

STRUCTURAL MEASURES

Structural measures consist of 12.0 miles of channel enlargement and 0.5 mile of channel clearing and shaping, (See Appendix C). Clearing and shaping is planned for the lower 0.5 mile of the stream (inside Swan Creek Wildlife Management Area). This type work allows the tree canopy over the stream to be left intact while trees, sand bars, and other debris are removed from the existing channel.

The design bottom width of the proposed channel enlargement ranges from 35 feet at the upper end to 90 feet at the lower. Designed side slopes are 3 feet horizontal to 1 foot vertical. The proposed channel is designed with a wide bottom width in relation to depth in order to keep velocities and rock excavation to a minimum. The proposed channel capacity is equivalent to the peak discharge produced by a three-quarter inch runoff from a storm of nine hours

duration or a storm of approximately one-year frequency. For more detail of design features of proposed channel work, see Appendix D.

The present flow condition where channel work is planned is perennial, however, most flow during dry periods is through sand and gravel that has been deposited in the stream. When this deposition is removed by channel work a higher base flow is anticipated.

Spoil from the channel excavation will be spread, graded to a 4:1 slope and smoothed sufficiently to permit the use of conventional farm equipment (See Appendix D). The excavated rock will be disposed of by burying in the spoil bank under a minimum of two feet of soil cover. The possibility of using the rock material for commercial use will be explored at the time of construction. Final grading of spoil will normally be done within seven calendar days of excavation.

All work will be performed within an area called "work area limits". The work area limits include the locations where channel work will be done and the areas for spreading the spoil material. This area will consist of a strip ranging from a width of approximately 300 feet in the upper end to 500 feet in the lower end. It will encompass an area of about 565 acres. The sponsors will secure the necessary easements on this area for project installation. A maintenance travelway will be provided along the channel for operating and maintaining the channel.

Openings will be left in the spoil at sufficient intervals to permit surface drainage. Thirty-three pipe inlets will be installed in the channel bank to prevent or lessen bank erosion. The spoil area and channel banks will be promptly established to vegetation that will provide a quick cover and minimize erosion. This vegetation will consist of sericea lespedeza, common bermudagrass, tall fescue, and Abruzzi rye.

About 300 acres of forest land will be cleared for project installation and spoil spreading. Seventy-eight acres of this cleared land will be occupied by the proposed channel. The remainder of the cleared land (222 acres) is for spoil spreading and will be planted to trees and grasses. Tree species will consist of pecan, poplar, walnut, and saw-tooth oak. Trees will be planted at a spacing that will allow equipment room for maintaining the channel.

A concerted effort has been made to keep adverse environmental effects to a minimum. Construction work will be performed during those periods suited to construction. This will depend on the prevailing weather conditions. When work is stopped during periods of high rainfall, provisions will be provided to minimize stream turbidity and sedimentation. The following measures have been incorporated into the channel design to prevent or lessen possible adverse effects on the environment:

- (1) Excavate the channel in reaches, leaving about 16 unexcavated sections to retain sediment during construction. The length of these sections will vary from 400 to 2,000 feet. These unexcavated sections will remain intact while vegetation is being established on the excavated reaches. Sediment retained above these sections will be removed when the remaining portion of the channel is constructed. Total construction period will be about two years.
- (2) Excavate approximately 1.5 feet below grade in 100-foot lengths at 1,000 foot intervals to act as sediment traps. These traps are designed to be temporary in nature and will catch loose material during and immediately following construction.
- (3) Leave narrow wooded strips between adjoining woods and the improved channel to allow wildlife a travel lane to reach the channel proper. Intervals will not exceed 400 feet.
- (4) Plant trees along the spoil to provide wildlife food and cover and shade for the stream.
- (5) Construct the proposed channel with a deepened centerline in order to maintain a uniform flow for fish passage during dry periods. This excavation will be one foot deep and will be about one-third the bottom width of the channel, (See Appendix D).
- (6) Leave five existing rock areas above grade to provide a condition where the channel flow will create pool areas for fish habitat.
- (7) Excavate, where practical, **from** one side leaving vegetation on the other side intact.
- (8) Install approximately 2,100 cubic yards of rock fill at locations where the channel banks are exposed to higher velocities and are more susceptible to erosion. Locations are to be determined by the construction engineer.
- (9) All areas will be vegetated immediately after construction to establish a quick cover and minimize erosion.

If any archaeological, scientific, or historical materials are found during construction, the Department of Interior; Chairman, Department of Anthropology, University of Alabama; and the Alabama Historical Commission will be notified so that they may investigate the findings.

The sponsors are encouraged to work with the City of Athens officials in regulating the flood hazard area to those uses that would minimize future potential damages and be consistent with the remaining flood hazard. The Soil Conservation Service will provide technical data developed during planning on the flood hazard area upon request. Public Law 566 does not contain an authority for enforcement of flood plain land use regulations.

Total estimated installation costs of both land treatment and structural measures and cost sharing, as shown in the watershed work plan, are as follows:

	P.L. 566	OTHER	TOTAL
Land Treatment Measures	\$ 15,300*	\$727,300	\$ 742,600
Structural Measures	746,536	67,700	814,236
TOTAL	\$761,836	\$795,000	\$1,556,836

* Estimated cost of technical assistance.

The construction cost, as shown in the watershed work plan, is \$575,840, all of which will be borne from P. L. 566 funds.

The average annual benefits to be expected from the installation of the structural measures is \$56,840, (See Appendix A). The average annual cost of the structural measures amortized over a 100-year period at $4 \frac{7}{8}$ percent interest is \$41,335. The resulting benefit-cost ratio is 1.4:1, (See Appendix A). These are the figures applicable to the watershed work plan and an addendum developed in 1969.

Based on 1973 cost estimates, $5 \frac{5}{8}$ percent interest, and current normalized prices the average annual benefits are \$116,150 and the average annual cost is \$81,900. The resulting benefit-cost ratio is 1.4:1.

The Swan Creek Watershed was approved for construction by the Agricultural Committees of the U. S. Congress on April 24, 1970. A review of channel improvement in operational watersheds, including Swan Creek, was made in accordance with SCS Watersheds Memorandum-108. The results of the study on Swan Creek placed all of the planned channel work in "Group 1" except the segment of channel work west of U. S. Highway 31 and it was placed in "Group 3". Agencies that participated in this study were the Soil Conservation Service, Alabama Department of Conservation and Natural Resources, and the Bureau of Sport Fisheries and Wildlife. Following the "108" study it was decided an environmental impact statement was needed.

Installation of the project has been delayed until an environmental impact statement can be prepared.

OPERATION AND MAINTENANCE

Land Treatment Measures

Landowners and operators under cooperative agreements with the Limestone County S&WCD will operate and maintain all land treatment measures. The Soil Conservation Service will provide technical assistance through the S&WCD for operation and maintenance of land treatment measures.

The forest land treatment measures will be maintained by the landowners and operators under agreement with the Limestone County S&WCD. The Alabama Forestry Commission in cooperation with the U. S. Forest Service will furnish the technical assistance necessary for operating and maintaining forest land treatment measures under the going Cooperative Forest Management Program. They will continue to furnish fire protection under the Cooperative Forest Fire Control Program.

Structural Measures

The Limestone County Board of Revenue will be responsible for the operation and maintenance of all channel work. They will provide the necessary funds, labor, and materials. The determination of the operation and maintenance work needed will be carried out through a sub-operation and maintenance agreement between the Limestone County Board of Revenue and the Swan Creek Watershed Conservancy District.

The County Board of Revenue, however, is primarily responsible for seeing that operation and maintenance is performed in a timely, adequate and otherwise appropriate manner to assure efficient operation and functioning of the works of improvement for the life of the project (100 years). Annual expenses are estimated to be \$1,275. The cost estimate is based on costs incurred in other similar projects and the kinds of operation and maintenance expected.

Operation and maintenance will be performed from a maintenance travel way. Channel maintenance will include such activities as periodic cleanouts necessary to restore channels to their planned capacities, stabilizing of eroded areas or washouts on channel banks, control of aquatic weeds that would reduce channel capacities, and repair or replacement of side inlets and other structures. It will be performed in such a manner to minimize any disturbance to tree plantings and vegetation. Maintenance and improvement of the general attractiveness or beauty of the channel and structure sites shall be considered as important features of the maintenance program.

Channel operations require little or no manual manipulation. Side inlet structures affecting two or more landowners will require coordination to assure that each landowner has the opportunity to realize the intended project objective.

An annual inspection program will be carried out and documented by a responsible official of the county and the Watershed Conservancy District, preferably accompanied by a landowner actively farming in the vicinity. A copy of the findings of this annual inspection will be sent to the Soil Conservation Service. The annual inspection will be made during the dry season, soon after the end of the rainy season so as to make it possible to complete needed maintenance before the start of the next rainy season. Items to be inspected include all components of the structural works of improvement.

The Soil Conservation Service will participate in the inspections during the first three years and thereafter as requested. These inspections, regardless of participants, should be made soon after major storms or unusually heavy periods of rainfall so as to locate any needed maintenance caused by the event. Years with major storms early in the season may require inspections at more frequent intervals than 12 months. The intent is to accomplish needed maintenance prior to a recurring storm that might seriously aggravate the situation.

An operation and maintenance agreement will be entered into by the county and the Service prior to the signing of a project agreement. It will list in detail the specific factors pertinent to the measures to be constructed.

ENVIRONMENTAL IMPACT

FLOOD PREVENTION, EROSION AND SEDIMENT

The average number of acres flooded annually will be reduced from 7,709 to 2,736, a reduction of 64.5 percent. The number of floods during the cropping season (May-November) will be reduced from four to one, and number of floods in the remainder of the year will be reduced from three to one. The total reduction in estimated average annual flood damages is 73 percent as follows:

Item	Estimated Average Annual Damage ¹		Damage Reduction Benefit
	Without Project	With Project	
Floodwater			
Crop and Pasture	\$30,135	\$ 6,590	\$23,545
Other Agricultural	14,950	5,625	9,325
Nonagricultural			
Roads and Bridges	490	0	490
Subtotal	\$45,575	\$12,215	\$33,360
Indirect	4,383	1,221	3,162
TOTAL	\$49,958	\$13,436	\$36,522

Flood damage reduction benefits to other agricultural land includes items such as barns and fences.

All 48 landowners in the flood plain will receive flood damage reduction benefits.

The reduction in flood hazard will provide an opportunity for more intensive farming practices in the flood plain. It will also provide an opportunity for some land use changes on the agricultural land.

¹ Adjusted normalized prices.

The future flood plain land use with and without the project is projected as follows:¹

FUTURE WITHOUT PROJECT			FUTURE WITH PROJECT		
Use	Percent	Acres	Use	Percent	Acres
Cropland	23	611	Cropland	27	718
Pastureland	43	1,143	Pastureland	54	1,435
Forest land	32	851	Forest land	18	478
Miscellaneous	<u>2</u>	<u>53</u>	Miscellaneous	<u>1</u>	<u>27</u>
TOTAL	100	2,658	TOTAL	100	2,658

Flood plain cropland is expected to increase after flood damage reduction is realized. This increase will occur as some cropland will shift from the steeper uplands into the flatter, more fertile flood plain. Cropland on the uplands will decrease as this shifting occurs and more intensive farming practices are allowed in the flood plain. More intensive farming practices will occur as flood plain farmers recognize a reduction in the flood hazard. The project is not expected to increase the cropland area in the watershed.

Flood plain pastureland will increase as the reduction in the flood hazard will encourage improved pasture management techniques such as fertilization, fencing, controlled grazing, etc. It is anticipated that after project installation some of the flood plain forest land will be cleared and planted to permanent pasture. This clearing of forest land for pasture along with that portion of forest land to be occupied by the channel work (about 78 acres) accounts for the future expected decrease in flood plain forest land. Total watershed forest land, however, will increase as fire protection is improved and 650 acres of planned tree planting is accomplished.

These expected land use changes after project installation will have the effect of placing watershed land in better agricultural uses in respect to land capabilities and limitations. Land use changes are anticipated on approximately 7,400 acres of watershed land.

Planned conservation land treatment measures will help reduce erosion and resulting sedimentation. Water control measures will remove runoff from the cropland at slower velocities and divert it onto well vegetated areas such as waterways or field borders. Some of the conservation land treatment measures are designed to protect crop fields during the winter months when the land is usually bare and rainfall is heavy. Vegetation tends to hold rainfall in place and allow it to seep into the ground thereby reducing surface runoff and increasing the ground water supply.

¹Land use projected to the year 2000.

An increased ground water supply will help maintain a more uniform stream base flow. Losses are expected to increase slightly due to canopy removal, but improved return flow is expected to offset this during periods of low flow.

Conservation land treatment measures and land use changes will result in a 27 percent reduction in total erosion in the watershed. The average annual gross erosion rate will be reduced from about 7.5 tons per acre without the project to about 5.5 tons per acre with the project land treatment measures installed, a reduction of 2.0 tons per acre.

The 27 percent reduction in total erosion is not a goal but is an estimate of what can be achieved by the people of the watershed in the project installation period (5 years). The land treatment goal is to use every acre within its capability and treat every acre according to its needs. The land treatment that is planned would achieve more than 27 percent reduction but the effectiveness was discounted to account for participation failures and partial loss of effectiveness before periodic renovation.

Without the project, an estimated 110,250 tons of sediment will be deposited annually near the mouth of Swan Creek and in Wheeler Reservoir. With the installation of the land treatment measures, sedimentation is expected to be reduced to 80,000 tons annually, representing a 27 percent reduction in sedimentation.

Average annual suspended sediment concentration at the mouth of Swan Creek in Wheeler Reservoir is presently about 600 mg/l; after project installation, this suspended sediment will be reduced to about 435 mg/l. This reduction in sediment-induced turbidity will be gradual over a period of seven to ten years, as conservation land treatment measures are installed and become fully effective.

Sediment traps and construction by reaches will hold sediment deposition to a minimum during construction. They are not intended to permanently trap all sediment; some sediment may be lost by scouring. The traps will fill with coarse-grained bed material within a year or two after construction but will have served their purpose by then.

The proposed forest land treatment and fire protection measures will develop a more mature and complex forest which will provide greater quantity and quality of multiple forest products. Forest product yield should achieve a net increase of about 10 percent above the yields of normally stocked stands during the rotation period (30 years for pulp and 50 years for hardwood).

The forest hydrologic condition or runoff producing potential will be improved by building up the humus layer of the forest floor. Undecomposed leaves, needles, twigs, bark and other vegetative debris on the forest floor form the litter from which humus, the organic layer immediately below the litter, is derived. Under good management practices (proper use, protection, and improvement), humus is porous and has high water infiltration and storage capacities. Under poor management practices (burning, overcutting, or overgrazing), humus is compact enough to impede the absorption of water.

A temporary increase in fire hazard will occur from the build up of dead and dying debris resulting from the accelerated forest stand improvement operation on 2,460 acres. A slight periodic increase in fire hazard will develop from time to time as a result of pruning and thinning operations. The forest aesthetic values in total will suffer some degradation from channel work, land clearing practices, and forest stand improvement operations. Flood plain hardwoods will be reduced primarily due to changed land use practices. Most of these changes will involve clearing hardwoods for pastureland after project installation.

Approximately 78 acres of existing forest land will be occupied by the proposed channel proper. About one acre of pastureland will also be occupied by the channel proper. This land will be lost for agricultural production. This 79 acres does not represent total land devoted to channel work; portions of the existing channel will be utilized by the proposed channel, (See Appendix C for channel alignment).

FISH AND WILDLIFE

The construction of 20 ponds as part of the land treatment program will provide some additional fishery. These ponds will be stocked with fish such as bass, bream, and channel catfish. Also, ponds will provide some food and rest areas for migrating waterfowl.

During construction, stream turbidity and sedimentation is expected to increase. This could be harmful to fish habitat in the lower reach of the creek and at Wheeler Reservoir by reducing plant food or hampering reproduction. "Attached algae and vegetation are affected by increased sedimentation by: (1) covering bottom materials with a layer of sediment, (2) reducing light transparency and preventing light penetration necessary for photosynthesis, (3) grinding algae by action of abrasive particles. A reduction of plant food is accompanied by a reduction in the poundage of plant feeding animals that can be supported, and this in turn limits the production of carnivorous animals including fish."¹

¹Mackenthun, K. M., The Practice of Water Pollution Biology, U. S. Department of the Interior, Federal Water Pollution Control Administration, p. 33, 1969.

Wallen (1951)¹ found that warm water fishes did not display behavioral reactions until concentrations of turbidity neared 20,000 mg/l. The daily surge of construction sediment is similar to the muddy flows of storm runoff from which fish retreat or hide.

Effects of increased turbidity during construction will have little impact on the fishery since only poor fishery exists in waters containing more than 400 mg/l suspended solids, and Swan Creek (at its mouth) has an average annual suspended solid concentration of about 600 mg/l. Increased turbidity will be temporary; the long-range effect of the project will be that of reducing suspended sediment concentrations in Swan Creek.

Studies of channel work in similar watersheds indicate that average summertime water temperature will be raised slightly (2-5 degrees) when some of the vegetation that shades the stream is removed during construction. As water temperature increases, life processes increase and the solubility of oxygen in water decreases. This means that as water temperature increases, available oxygen in the water decreases. Variations in water temperature can also affect fish reproduction cycles since this function takes place under restricted temperature ranges.²

"The National Technical Advisory Committee on Water Quality Criteria has recommended that to maintain a well rounded population of warm water fishes, heat added to a fresh water stream should not exceed that which would raise the water temperature more than five (5) degrees at the expected minimum daily flow for the month involved."³

The project could significantly affect the habitat of the Tuscumbia Darter, Big Eye Shiner, Flame Chub, and the Hellbender since Swan Creek lies within the possible range of existence of these vertebrates. The Tuscumbia Darter and Flame Chub are spring dwellers and could be significantly affected if channel work alters spring systems or disrupts ground water regimes. The Big Eye Shiner and Hellbender are at the southern margin of their range and will be affected primarily by habitat destruction and increased sediment movement during construction.

In addition to the 300 acres of forest land that will be cleared for project installation and spoil spreading, an additional 72 acres will be converted from bottom land hardwoods to pastureland or cropland. The reduction of 372 acres of bottom land hardwoods will affect the habitat of indigenous woodland wildlife species by reducing the amount of food, cover, nesting sites, and travel lanes. Some of the

¹Wallen, E. I., 1951, The Direct Effect of Turbidity on Fishes, Oklahoma Agricultural and Mechanical College, Arts and Sciences Studies, Biology Series.

²Mackenthun, K. M., The Practice of Water Pollution Biology, U. S. Department of the Interior, Federal Water Pollution Control Administration, p. 33, 1969.

³Ibid, p. 24.

animals more obviously affected would be the grey squirrel, opossum, raccoon, and various non-game birds. Streambank wildlife food and cover will be removed during the construction process; this effect, however, will be held to a minimum by excavating from one side as described earlier.

The removal of trees and other vegetation on the streambank will reduce the amount of detritus which in turn will affect the detritus food chain. This condition will improve as trees planted along the channel bank increase in size.

ECONOMIC AND SOCIAL

It is estimated that 25 man-years of employment will be created during the two years of channel construction. This will provide employment opportunities for residents in the area to supplement their income,

Local employment opportunities, together with reduced expenditures for road and bridge maintenance and increased agricultural incomes, will have an effect of providing a higher standard of living for watershed inhabitants.

Farmers in the watershed will increase net profits as a result of the project. Increased profits will come from: (1) less likelihood of having to replant, (2) fewer crop losses from floods, (3) cultivation on a more timely basis, (4) better quality of products produced, (5) less delay at harvest time, and (6) improved pasture management. The installation of the project will also allow more intensive farming practices which will have an effect of increasing the demand for agriculturally oriented goods and services, thereby stimulating the local economy.

There will be damages to the aesthetic appeal of the creek to homeowners along the creek during construction. The types of construction techniques planned and the establishment of vegetation as soon after construction as possible will help minimize the effect.

Secondary impacts occur in the form of better marketing and transportation systems. Reduced road and bridge damages will result in improved transportation conditions in the watershed. Accident hazards caused by flooding will be reduced or eliminated.

FAVORABLE ENVIRONMENTAL EFFECTS

- a. Reduce average annual flooding from 7,709 acres to 2,736 acres (64.5 percent reduction) and average annual flood damages from \$49,958 to \$13,436 (72 percent reduction).

- b. Reduce the number of cropping season floods (May-November) from four to one and the dormant season floods from three to one each year.
- c. Reduce annual erosion and sedimentation by 27 percent or two tons per acre annually.
- d. Improve land use in regard to capabilities and limitations on 7,400 acres of watershed land.
- e. Provide a more uniform stream base flow.
- f. Increase forest product yield by 10 percent during the rotation period.
- g. Improve the hydrologic condition of forest soils.
- h. Increase forest fire protection on 11,000 acres of forest land.
- i. Increase farm pond fishery by installing 20 ponds.
- j. Create 25 man-years of employment during the 2 year installation of the channel work.
- k. Improve local economy.
- l. Improve transportation systems.

ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

- a. Reduce bottom land hardwoods for timber production and wildlife habitat by 372 acres.
- b. Temporary increase in forest fire hazard due to forest stand improvement practices on 2,460 acres.
- c. Reduce forest aesthetic values.
- d. Increase sedimentation and stream turbidity during and immediately following construction.
- e. Remove streambank wildlife food and cover during construction.
- f. Disturb the possible habitat of the Tuscumbia Darter, Flame Chub, Big Eye Shiner, and Hellbender.

ALTERNATIVES

a. Conservation Land Treatment Alone

Conservation land treatment includes the installation of measures such as terraces, diversions, farm ponds, drainage surface ditches, grassed waterways, field borders, conservation cropping system, pasture and hayland plantings, and other similar measures, (See Appendix E), to adequately treat 16,000 acres of cropland and 10,000 acres of pastureland. Forest land treatment measures provide adequate treatment of 3,110 acres, and strengthen the fire control program on 11,000 acres. These measures alone will have only a minor effect on reducing floodwater damages. They have a favorable effect on reducing sediment yields by 2.0 tons per acre per year, improving the water holding capacity of the soil and providing the needed treatment of the soil within its capability. All adverse effects except item b above will be eliminated. Land treatment costs as estimated in the watershed work plan are \$742,600.

b. Conservation Land Treatment, Flood Plain Zoning and Flood Insurance

Effects of the conservation land treatment would be the same as described above.

This alternative would provide zoning of the flood plain to minimize potential flood damages. Zoning would restrict the use of the flood plain to the type development that would be consistent with the flood hazard.

The City of Athens and Limestone County would request a flood insurance study from the Federal Insurance Administration. For flood insurance to be available for the local residents the city and county would be required to adopt land use regulations. The resulting effect would minimize potential damages by regulating the developments in the flood plain.

The costs of the flood insurance study would be borne by the Federal Insurance Administration. The cost of the flood insurance would be paid for by the individual landowners who requested it. This program would not reduce the floodwater damages that are now experienced. It would minimize future floodwater damages by regulating development in the flood plain.

c. Conservation Land Treatment and Floodwater Retarding Structures

Effects of the conservation land treatment would be the same as described above.

Five floodwater retarding structure sites, were evaluated. Two of the sites were on Mud Creek and the other three were located on Town Creek, Muddy Creek, and Swan Creek respectively. The latter three sites would have affected the area benefitted shown in Appendix C.

The Town Creek site is located about one mile above Alabama Highway 208; the Muddy Creek site is located about two miles above the confluence of Muddy and Turkey Creeks; and, the Swan Creek site is located about one-fourth mile above the confluence of Swan and Muddy Creeks. Structural data on the three sites is as follows:

ITEM	UNIT	SITE		
		Town Creek	Muddy Creek	Swan Creek
Drainage Area	Sq. Mi.	6.05	1.56	5.47
Maximum Height of Dam	Feet	30	20	19
Capacity				
Sediment	Ac. Ft.	212	126	196
Retarding	Ac. Ft.	1,029	609	1,721
TOTAL	Ac. Ft.	1,241	735	1,917
Surface Area				
Sediment Pool	Acres	71	21	54
Retarding Pool	Acres	160	150	400
Maximum Depth of Sediment Pool	Feet	10	7	7

The three structure sites would control 13.08 square miles, 7,371 acres or 13 percent of the 56,429 acres in the watershed. The floodwater damages could be expected to be reduced by an equivalent amount. This level of protection would not permit more intensive farming operations or a change in land use.

The three structure sites would require the relocation of ten houses, the raising or abandonment of portions of three county roads, and the raising of a segment of the L&N Railroad. The sediment pools would be shallow because of the topography of the area.

The construction cost of the three structures estimated to be \$349,060. The total installation costs, including land rights, engineering, and administration costs is estimated to be \$1,500,000.

d. Conservation land treatment and a floodway system

Effects of the conservation land treatment would be the same as described above.

The floodway would be located away from the existing channel and along one side in the lowest areas of the flood plain. The floodway and existing channel would provide approximately the same level of protection as the planned project.

Dimension of the floodway would range from a width of 65 feet and a depth of 2.5 feet in the vicinity of Sta 37+00 to a width of 145 feet and a depth of 3 feet at the end of the planned work. The right of way needed for the floodway and spreading of the spoil material would range from approximately 180 to 330 feet. This would require about 390 acres of land for the floodway and spreading of spoil material. The 390 acres would require clearing of a smaller acreage of bottomland hardwood trees than the planned project. A larger acreage of cropland would be required for the floodway than the planned project.

A floodway is hydraulically inefficient and it is expected that low flows in the floodway will quickly meander. This will result in uneven deposits of sediment, swamping out of some areas and much higher maintenance costs than the planned project. Additional costs will be incurred as a bridge will need to be installed on each road wherever the floodway crosses it. The floodway area would be established in a good vegetative cover and could be used for pasture.

The installation costs of the floodway system would be greater than the planned project.

e. Conservation land treatment and a dike system

Effects of conservation land treatment would be the same as described above.

Earth dikes would be constructed on each side of Swan Creek to protect the adjacent land against overflow or flooding from the stream. Water collected on the landside of dikes would discharge through the dikes by gravity flow through pipes equipped with automatic flap gates. When prolonged

flood stages prevent gravity outflow, water on the landside of the dikes would be stored temporarily in low areas until it could be removed by continuous pumping.

Dikes in the vicinity of the City of Athens would be Class I dikes according to Soil Conservation Service specifications and would provide protection from the 100-year frequency flood event. All other dikes would be Class II dikes and would provide protection from the 25-year frequency flood event. This is greater protection than is provided by the planned project.

The dike system would not alter the existing stream system nor affect the canopy of the stream. This means less damage to fish and wildlife habitat than will result from the planned project. However, during periods of storm runoff, the dikes would increase depths of stream flow, velocities, and maximum discharges within the diked reaches.

The floodway, dikes, berms, and borrow areas would require a right-of-way 490 to 550 feet wide and would occupy approximately 810 acres. Since approximately 65 acres of the floodway would consist of existing channel, 745 acres (28 percent) of the flood plain expected to benefit from the planned project would be committed to the system of dikes. Provided suitable embankment material could be located on hill land in the proximity of the flood plain perimeter, and especially near the narrower flood plain, fill material might be obtained there rather than from within the flood plain. This would decrease the acreage of protected flood plain committed to the dike system by a maximum of approximately 200 acres. However, the productivity of hill land used for borrow areas would be greatly reduced.

Forest land clearing for such a system would be approximately 350 acres. There would be increased stream turbidity during and immediately following construction due to silt from disturbed areas.

There would be a possibility of small areas swamping out along the landside of dikes even with the use of pipes and pumps.

Operation and maintenance costs would be greater than for the planned project mainly due to conduits and pumps.

The estimated installation cost of this alternative would be approximately twice that of the planned project.

- f. Conservation land treatment and selective clearing and snagging.

Effects of the conservation land treatment would be the same as described above.

Clearing and snagging of Swan Creek would increase the capacity of the channel by about 50 percent. It would require much less right-of-way than the planned project. There would be less disturbance to wildlife habitat along the stream channel. Stream temperatures would not be expected to change and there would be less effect on the aesthetics of the area than the planned project. Provisions would need to be made for ingress and egress for the removal of the trees from the channel and for its operation and maintenance.

The level of flood protection provided would be much less than the planned project. Opportunities for more intensive land use and changed land use would be foregone. Also, flood damage reduction benefits would be less than the planned project.

Operation and Maintenance costs would be expected to be equal to or greater than the planned project.

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

In consideration of present trends, the expected future land use in the watershed will be agricultural with some rural residential development in the uplands. The flood plain is expected to be used primarily for agricultural production.

The project will not directly affect the growth of the remaining bottom land hardwoods. Some clearing of bottom lands is anticipated as a result of the protection provided by the modified channel. Long-term cropland productivity will be increased when land treatment measures are established. Expected future land use changes will also increase long-term productivity as more land will be used according to capabilities.

The planned land treatment measures and channel work will reduce erosion and conserve the natural resources during and after the project's designed life. With adequate maintenance, channel work will continue to reduce flooding indefinitely. The benefits were evaluated on a 100-year period, but because the channel work and land treatment measures will function after their designed life (100 years), benefits will continue to accrue.

There will be cumulative effects of this and other similar projects on tributaries of the same reach of the Tennessee River (Wheeler pool below Guntersville Dam). The Guntersville Dam controls waterflow and prevents sediment from moving downstream. Projects which will affect the designated reach of the Tennessee River are Swan Creek, Crowabout Creek, Paint Rock River, Little Paint Creek, and Hurricane Creek Watershed projects. The cumulative effects of waterflow control and sediment entrapment by these projects will increase after-storm streamflow duration and reduce turbidity and sediment yield to the Wheeler Reservoir. Waterflow control will be of minor consequence since the river is so large and is already controlled by Guntersville Dam.

By improving the land and water resources in Swan Creek Watershed, the environmental quality of the area and the State of Alabama will be improved.

This project, in conjunction with the other small watershed projects planned for installation, will have a long-term effect of reducing flood damages, creating a more stable agriculture, and improving the local economy of the Tennessee River Valley area.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

About 78 acres of existing forest land and one acre of pastureland will be permanently committed to the project and will be occupied by the proposed channel. These areas will be lost for agricultural production and wildlife habitat. The commitment of this land to the project provides for reduced flood damages that would not be possible otherwise.

CONSULTATION WITH APPROPRIATE FEDERAL AGENCIES AND REVIEW BY STATE AND LOCAL AGENCIES DEVELOPING AND ENFORCING ENVIRONMENTAL STANDARDS

a. General

The Swan Creek Watershed Conservancy District was organized in September 1959. The local sponsoring organizations submitted an application for assistance to the State Soil and Water Conservation Committee in December 1959. The State Committee approved this project for preliminary investigation in 1964. Water management problems were discussed with sponsors and interested citizens at a public meeting on April 3, 1964. Preliminary investigations were initiated in the fall of 1964, and the results of these investigations were discussed with sponsors and landowners at a public meeting on January 19, 1966.

Authorization for planning was granted on October 24, 1966. In November of 1966, a field study of the watershed was made by representatives of the U. S. Fish and Wildlife Service, the Alabama Department of Conservation and Natural Resources, and the Soil Conservation Service. The results of this field study were presented at a meeting on January 12, 1967, attended by the sponsors and representatives of these same agencies. The Alabama Department of Conservation and Natural Resources expressed opposition to the project at this meeting but agreed to offer suggestions for mitigating possible damages to fish and wildlife habitat. On April 11, 1967, the suggestions were presented to the sponsors. All of these suggestions were incorporated into the plan except for a floodway development in the Swan Creek Wildlife Management Area and a long-term hunting rights agreement on the wooded area between the Swan Creek Wildlife Management Area boundary and U. S. Highway 31. The floodway was not included because of Tennessee Valley Authority objections. The long-term hunting rights agreement was not included because the landowners did not agree to this suggestion. Wherever practical mitigation measures

suggested by the Alabama Department of Conservation and Natural Resources were included as mentioned under "Planned Project". The Tennessee Valley Authority agreed to the final design in a letter dated October 13, 1969.

A final design was made which changed channel excavation to channel clearing and shaping within the wildlife management area. The Alabama Department of Conservation and Natural Resources agreed, at a meeting on March 17, 1972, that the new design would reduce adverse effects on fish and wildlife. The Tennessee Valley Authority agreed to the final design in a letter dated April 26, 1972,

The U. S. Forest Service provided information concerning project environmental effects on forest land in the watershed. Forest Service comments are reflected within the statement wherever forest land is discussed.

b. Discussion and Disposition of Each Problem, Objection, or Issue Raised on the Draft Environmental Statement by Federal, State, and Local Agencies, Private Organizations, and Individuals.

Comments were requested from the following agencies, groups, and individuals:

Department of Commerce
Department of Health, Education, and Welfare
Department of Interior
 Bureau of Sport Fisheries and Wildlife
U. S. Army Corps of Engineers
Environmental Protection Agency
Tennessee Valley Authority
Appalachian Regional Commission
Alabama Development Office
 Soil and Water Conservation Committee
 Alabama Department of Conservation and Natural Resources
 Environmental Health Administration
 Alabama Water Improvement Commission
Top of Alabama Regional Council of Governments
Alabama Archeological Society
Alabama Cooperative Fishery Unit, Auburn University
Natural Resources Defense Council, Inc., Washington D.C.
Alabama Wildlife Federation
Alabama Sportsman Conservation Club
The Alabama Conservancy - Birmingham Chapter
The Alabama Conservancy - Huntsville Chapter
Bradley, Arant, Rose, and White; Attorneys, Birmingham, AL
Bob Truett, Individual, Birmingham, AL

Comments were received from the following agencies, groups, and individuals:

Department of Health, Education, and Welfare
Department of Interior
Environmental Protection Agency
Tennessee Valley Authority
Appalachian Regional Commission
Alabama Development Office
Soil and Water Conservation Committee
Alabama Department of Conservation and Natural Resources
Environmental Health Administration
Alabama Water Improvement Commission
Alabama Wildlife Federation
Alabama Sportsman Conservation Club
The Alabama Conservancy - Birmingham, Alabama
The Alabama Conservancy - Huntsville, Alabama
Bradley, Arant, Rose, and White; Attorneys, Birmingham, AL
Citizens to Save Swan Creek
Sierra Club
Bob Truett, Individual, Birmingham, AL
Richard K. Smith, Individual, Birmingham, AL

Notification of "No Comment" was received by telephone from the U. S. Army Corps of Engineers and Department of Commerce.

Summary of Comments and Responses

Each issue, problem, or objection is summarized and a response given on the following pages. Comments are serially numbered where the commentor has supplied multiple comments. The letters of comments are attached as Appendix B.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

1. Comment Summary: It may be well to consider a total insect control program to include mosquitos.

Response: Mosquitos are not a problem in the watershed. The planned project should eliminate many of the stagnant pool areas that are mosquito breeding grounds.

U. S. DEPARTMENT OF THE INTERIOR

1. Comment Summary: This proposed project will not adversely affect any existing, proposed, or known potential units of

the National Park System, or any known historic, natural, or environmental education sites eligible or considered potentially eligible for the National Landmark Programs.

Response: None.

2. Comment Summary: The statement should contain evidence of contact with the Historic Preservation Officer for the State of Alabama.

Response: Mr. David L. DeJarnette, Curator, The University of Alabama, Museum of Natural History, contacted W. B. Lingle, State Conservationist, Soil Conservation Service, by letter dated July 17, 1973 concerning possible historical sites of value, see page 11.

3. Comment Summary: Environmental assessments should be based on resource knowledge before the fact.

Response: Concur. At the time planning was authorized in 1966, on Swan Creek, the National Environmental Policy Act (NEPA) had not been passed. In complying with the provisions of NEPA, environmental assessments were made for developing the environmental statement.

4. Comment Summary: Present flow conditions should be stated in million gallons per day for low flow and average flow. Any changes in low flow and average flow which might result after construction should be discussed.

Response: The average runoff from the watershed is about 22 inches per year, which is equivalent to an average flow of 163 cubic feet per second (cfs) or 105 million gallons per day (mgd). The annual base flow is about 95 cfs or 61 mgd, see page 6.

It is anticipated that the base flow will be more uniform with the planned project. It is also expected that the average flow will be approximately the same as it is presently.

5. Comment Summary: The statement should more fully and clearly discuss the significant, direct, and secondary, losses of fish and wildlife habitat which will result from the proposed stream excavation.

Response: An estimated 372 acres of forest land in the flood plain will be cleared for the planned project and will result in losses of fish and wildlife habitat. Approximately 222 acres will be revegetated and planted in trees, see page 20. It will require several years before these trees will provide the type of habitat

that now exists. Part of the wildlife habitat losses are expected to be offset by the planned land treatment measures, see pages 18 and 19.

6. Comment Summary: It should be indicated that physical attributes necessary for the support of significant fishery are present in Swan Creek, and the project will have a significant adverse effect on them.

Response: The Alabama Water Improvement Commission has classified Swan Creek from its source to the Tennessee River as having a potential for a fish and wildlife resource, see page 6. The planned project will alter the physical attributes of the stream. As indicated on page 9, the Swan Creek fishery resource is best in the extreme lower reaches. This resource is not expected to be affected.

7. Comment Summary: The alternative section should be revised to emphasize the environmental effects stemming from the alternatives.

Response: Concur - The alternative section has been modified.

8. Comment Summary: The alternative section should include a discussion of a flood plain levee system, floodway and selective clearing and snagging.

Response: Concur - The final statement includes these alternatives.

ENVIRONMENTAL PROTECTION AGENCY

1. Comment Summary: The construction operations in conjunction with the 12.5 miles of channel improvement will undoubtedly cause temporary turbidity and silting in reaches of the stream below the work, and the confinement of floodwater in the main channel will increase scouring and silting within the channel. However, this will be offset by improved land use in the upper areas of the watershed and by the fact that floodwaters will cause less scouring and erosion of the flat flood plains.

Response: Concur - A 27 percent reduction in sedimentation at the lower end of Swan Creek is expected.

2. Comment Summary: To minimize damage to water quality during construction, it is recommended that final plans and specifications include provisions to protect the quality of area waters from accidental dumping of excavated materials or other wastes into the stream channel. In particular, construction should be

carried out at low flows so as to minimize the consequent increases in turbidity; areas subjected to erosion should be protected with vegetation, riprap or other stable materials as rapidly as possible; and excavated materials should be handled so as to minimize the development of turbid waters.

Response: Concur - Measures have been incorporated into the channel design to prevent or lessen possible adverse effects to the environment. These measures are described on page 21.

3. Comment Summary: The reader is led to think that Swan Creek is not classified, while actually it is classified for Fish and Wildlife from its source to the Tennessee River.

Response: The statement has been modified, see page 6.

4. Comment Summary: It should be noted that an effluent of about 2 MGD from the Athens, Alabama sewage treatment plant enters Swan Creek via Town Creek. This facility already provides secondary treatment, yet the impact statement reports that "Stream fishery values are low due to pollution from urban areas."

Response: The effluent from secondary treatment is noted on pages 5 and 6. Fishery values are low even though secondary treatment is provided.

5. Comment Summary: The proposed project would reduce the natural recovery of Swan Creek by changes in temperature and natural reaeration factors, which could then have an adverse effect on the extreme lower reach where the fishing has greatest value.

Response: Temperatures are expected to increase from 2-5 degrees Fahrenheit, see page 30. Measures incorporated into the design, see page 20 and 21, are designed to lessen possible adverse effects on the environment.

TENNESSEE VALLEY AUTHORITY

1. Comment Summary: We believe implementation of the measures described is important to prevent or lessen possible adverse effects on the Swan Creek Wildlife Management Area. Studies by TVA fisheries biologists confirm that the lower reaches of Swan Creek have a high fisheries value. The shallow waters enhance this value by providing spawning and nursery areas for species such as crappie, largemouth bass, and sunfishes. We believe the present wildlife resources in the management area are also of high value. For example, wood ducks are known to

nest in considerable numbers in the riparian forest strip along the present stream channel. If you wish, we would be happy to have the staff of our Division of Forestry, Fisheries, and Wildlife Development to meet with you or to furnish to you the data we have on the area.

Response: A request was made for information to Mr. Thomas H. Ripley, Director, Division of Forestry, Fisheries and Wildlife Development, Tennessee Valley Authority by Mr. W. B. Lingle, A reply was made on June 15, 1973, see page 9, and the information has been incorporated into the statement.

2. Comment Summary: The environmental statment states an average annual suspended sediment concentration in Swan Creek of about 600 parts per million*(ppm) while the Tennessee Valley Authority grab samples indicate an average suspended sediment concentration of about 65 ppm.

(* One part per million is equivalent to one milligram per liter (mg/l)).

Response: The estimate of 600 ppm is average annual concentration, including storm flows which normally carry a very high percentage of total sediment load. The 65 ppm figure is an average of six samples, all taken at very low to moderate stream-flow. The two figures are, therefore, not in conflict since one includes storm flows in the average annual condition, and the other is an indication of the stream condition during low flows.

3. Comment Summary: Data for the Huntsville Standard Metropolitan Statistical Area indicating increasing urbanization of the traditional agricultural land use in Limestone County support the need to encourage flood plain zoning. Flood plain zoning outside of the Athens corporate limits should also be considered as a complement to the project.

Response: Concur - Limestone County, however, does not have the necessary legislation to zone the flood prone areas at the present time.

THE APPALACHIAN REGIONAL COMMISSION

1. Comment Summary: With the current restrictions placed on REAP funds, what is the expectation that benefits resulting from land treatment will occur.

Response: The Rural Environmental Assistance Program (REAP) has been reinstated along with a new program called Rural Environmental Conservation Program (RECP). Planned land treatment measures are expected to be applied regardless of financial assistance available to the landowners. Many of the other PL-566 watersheds in Alabama show the amounts of the land treatment practices applied exceed the amounts planned.

2. Comment Summary: Are recurring costs to maintain land treatment practices made as part of benefit/cost calculations?

Response: The benefit-cost ratio is based on a comparison of the benefits to be derived from the structural measures and costs of the structural measures, including operation and maintenance. There will be an estimated flood damage reduction benefit of \$1,739 annually from land treatment, see Appendix A, but this is not included in the benefit/cost comparison. Additional on-farm benefits will accrue to the land treatment program, but such benefits are normally not evaluated.

3. Comment Summary: To what extent could additional land treatment measures be applied, or selected for application, that would reduce the level of suspended solids to less than 400 ppm to improve the fishery resource to a "good" level.

Response: The level of land treatment projected in the plan is one that can be achieved by voluntary landowner participation. It would be theoretically possible with the same land use distribution that is projected for the project, to achieve a 68 percent reduction in erosion. This level of land treatment would reduce the average annual suspended sediment concentration from 435 ppm to 190 ppm which is in the range of fair fishery waters as cited by Mackenthun, see page 16.

4. Comment Summary: To what extent is decrease in erosion on the upland supplanted by increased erosion on the more intensively farmed flood plains?

Response: Erosion on the flood plain will increase sediment by approximately 240 tons annually. This increase was considered in calculating gross erosion and sediment yields and is reflected in the 27 percent net reduction delivered at the mouth of the watershed.

5. Comment Summary: What alternative courses of action would reduce sediment further than the 27 percent predicted for the project?

Response: Optimum land treatment on the predicted land use could reduce sediment yield by about 68 percent; changing the land use in the entire watershed to pasture could theoretically reduce sediment yield by about 77 percent and to woodland by about 95

percent. None of these alternatives were considered to be viable since they would entail dislocation of the life style of the people in Athens and the watershed.

STATE SOIL AND WATER CONSERVATION COMMITTEE

1. Comment Summary: The State Soil and Water Conservation Committee strongly supports the proposed Swan Creek plan and is of the collective judgment that this small watershed development would be highly beneficial to the area when it is completed.

Response: None.

STATE OF ALABAMA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

1. Comment Summary: Figures included in the draft environmental impact statement on flood damages, etc. are entirely different than those in the work plan.

Response: An addendum to the watershed work plan was prepared in November 1969, which updated the costs and also the interest rate from $3 \frac{1}{4}$ to $4 \frac{7}{8}$ percent. The costs and interest rates also changed the estimated benefits. The figures in the environmental statement are the same as in the work plan addendum. Copies of the addendum are available at the Soil Conservation Service Office in Auburn, Alabama.

2. Comment Summary: The loss of 372 acres of flood plain woodland will have an adverse effect on certain species of wildlife.

Response: Concur - Some of the species more seriously affected are described on page 31.

3. Comment Summary: The manipulation of stand composition of approximately 2,500 acres of hardwoods and hardwood pine stands in order to develop pure pine stands will adversely effect wildlife.

Response: This is true if a mixed pine and hardwood forest is converted to pure pine. However, this is not anticipated, the work will be to improve timber production and wildlife mast production by eliminating the less productive species for timber and wildlife mast.

4. Comment Summary: The conversion of 372 acres of woodlands to row crops, pastures and other miscellaneous agricultural uses in addition to the 12 plus miles of ditch digging and spoil dumped on the streambank will increase rather than decrease sediment reaching the Wheeler Reservoir.

Response: Measures to prevent or lessen possible adverse effects on the environment are described on page 21. In addition, the amount of sediment leaving the watershed is expected to be reduced by 27 percent, see page 28.

5. Comment Summary: The possibility of using less destructive construction techniques than stream channelization, as directed by Watershed Memorandum 108, was not investigated.

Response: Measures to prevent or lessen possible adverse effects on the environment are described on page 21. In addition, several alternatives to the planned project were evaluated and described on pages 34 through 38.

ALABAMA WATER IMPROVEMENT COMMISSION

1. Comment Summary: Wildlife resources listed as being low to moderate in number may be true when compared to other sections of the United States; but as compared to Alabama, it contains one of the better waterfowl wintering areas and our best goose wintering area.

Response: The Swan Creek Wildlife Management Area does provide good waterfowl wintering areas. Approximately 2,400 acres of the watershed is located in the Management Area, see page 7. The remainder of the watershed game resources are estimated as low to moderate in number, see page 9.

2. Comment Summary: The report appears to be lacking in information relating to increased nutrient flow into the lower reaches of the creek and into Wheeler Reservoir on the Tennessee River.

Response: The reduction in total overland runoff and erosion will have the effect of reducing rather than increasing sediment, nutrient, and pesticide inflow. Studies can be cited that show an increase in fertilization does not necessarily increase nutrient content of the stream. For example, a 30-year study of the Rio Grande River showed that while use of nitrogen fertilizer dramatically increased, overall nitrate¹ nitrogen concentration in the river actually decreased.

¹Bower, C. A. and Wilcox, L. U., 1969, Nitrate Content of the Upper Rio Grande As Influenced by Nitrogen Fertilization of Adjacent Lands, Soil Science Society of American Proceedings, Vol. 33, pp. 971-973..

Other experiments in South Carolina¹ showed that nitrogen losses were least where the greatest amounts of nitrogen fertilizers were applied. One 5-year experiment measures 154 pounds of nitrogen loss per acre where no nitrogen was applied and only 18 pounds of nitrogen loss per acre where 680 pounds of nitrogen per acre was applied. A fertilized crop increased uptake of nutrients and reduced leaching. What will be the affects of increased stream temperature on aquatic life.

3. Comment Summary: What will be the affects of increased stream temperature on aquatic life?

Response: Stream temperatures are expected to increase slightly (2-5 degrees Fahrenheit). Available oxygen will decrease. Fish reproduction cycles may be adversely affected, see page 27.

4. Comment Summary: Siltation reduction within the stream is based on streambank stabilization, however, if the project area is maintained, the stabilization of the banks will be short-lived. If the banks are not maintained, the stream will revert back to its natural state and the original stabilization project will have been in vain.

Response: Most of the reduction in sediment yield is based on land treatment measures and changes in land use. Measures to minimize streambank erosion are described on page 21. An operation and maintenance agreement will be entered into between the Limestone County Board of Revenue and Soil Conservation Service and will include provisions for repairing eroded areas.

ALABAMA WILDLIFE FEDERATION

1. Comment Summary: Question was raised relative to figures used in the environmental statement not corresponding to figures used in work plan. Also, the interest rate used in developing the work plan was questioned.

Response: Refer to page 47, Comment 1. of the Alabama Department of Conservation and Natural Resources.

¹Allison, F. E., Roller, E. M. and Adams, J. E., .959, Soil Fertility Studies in Lysimeters Containing Lakeland Sand, Technical Bulletin No. 1199, U. S. Department of Agriculture, Washington, D. C., pp. 62.

2. Comment Summary: If yields in the watershed are as stated in the environmental statement, how is it possible that the average income is not greater than the \$5,000 listed for Limestone County?

Response: Yields were estimated based on data compiled during planning by SCS agronomists. The \$5,000 is not an "average" income; this is a figure used to illustrate the value of farm sales; see the 1969 Census of Agriculture, Limestone County

3. Comment Summary: Much of the benefits claimed will result from converting 372 acres of the woodlands within the flood plain (44 percent) into crop and pasturelands. It is recommended the environmental impact statement include data on number of acres in the watershed on which the U. S. Government is paying under ASC for not planting crops.

Response: A discussion of what damage reduction benefits will result from the planned project is found on page 26. Part of the benefits will result from the flood plain woodlands changing into a more intensive land use. However, these are a relatively small percentage of the total benefits.

4. Comment Summary: Limestone County already ranks 67th in acres of woodlands (some 42,000 acres less than any other county). The loss of 372 acres of flood plain hardwoods would be a serious environmental loss to this county.

Response: Total forest land in the watershed will increase as fire protection and planned tree plantings are accomplished, see page 27.

5. Comment Summary: SCS claims that land use changes and land treatment measures will reduce sediment into Wheeler Lake by 30,250 tons annually. This cannot be true. More erosion will occur when 372 acres of woodlands are cut and converted to row crops and other agricultural uses. With the many thousands of tons of sediment that will result from digging out and widening the channel and the placing of spoil along the streambank and with the removal of 372 acres of woodlands there can only be an increase of sediment reaching Wheeler Lake.

Response: Increased stream turbidity is expected to occur during construction, however, measures have been designed to lessen the adverse effect on the environment, see page 21. A small increase in erosion is expected on the flood plain with the conversion of woodland and pasture to cropland, see page 46, Response to Comment Summary #4. The conservation land treatment measures to be applied on the upland areas will reduce the amount of erosion described.

6. Comment Summary: Stand improvement measures on 2,500 acres of forest land will convert pine and hardwood stands to pure stands and therefore will have a serious effect on wildlife.

Response: Stand improvement measures will improve stands that are already present, they will not significantly change the composition of the stands.

7. Comment Summary: A comment was raised that a bottleneck will be created causing more and larger floods if the project is terminated at the L&N Railroad.

Response: Termination of excavation at the L&N Railroad will cause minor increase in the flood stages (depths) in the lower reaches. Stage-discharge relationships for a valley cross section at the TVA boundary below the railroad indicate that the 1.06-year frequency (94.5 percent chance) discharge would reach elevation 566.0 under present conditions. Under future conditions with excavation terminated at the L&N, flow for the same frequency under planned conditions would reach the 566.2 elevation. At this same section, the 100-year (1 percent chance) discharge would reach elevation 569.5 under present conditions and 570.0 under future conditions. These two sets of comparisons indicate increases in peak discharge rates of approximately 20 and 30 percent under the project. The Swan Creek flood plain is sufficiently wide that the increased peak discharge produces only minor increases in depth.

8. Comment Summary: Fish and wildlife losses from direct channelization and the removal of quality streambank wildlife habitat will be just as real as the losses from floods and should, therefore, be included as a cost of the project,

Response: No monetary values were estimated for fish and wildlife losses. Measures to prevent or lessen possible adverse effect on the environment are described on page 21.

9. Comment Summary: The statement does not indicate that the least destructive construction techniques would be used, as required by Watershed Guidelines Memorandum 108.

Response: Measures to prevent or lessen possible adverse effects on the environment are described on page 21. Also, the alternatives section pages 34-38 considered other means of flood protection.

10. Comment Summary: Could suction pumps be used to remove sand and gravel instead of channel excavation?

Response: Use of stationary dredges would not be a workable method of excavation on Swan Creek. For this method to work satisfactorily, the bedload must be predominantly sand-sized. Finer material can be induced to move but won't settle out readily. This can result in severe turbidity and sedimentation problems downstream from the dredge operation. Gravel-sized material does not move readily more readily except under high velocity situations not present on Swan Creek. Further, Swan Creek is heavily loaded with fallen trees which wouldn't be influenced by the dredge operation. If Swan Creek were dredged to bedrock, which is very shallow, and left at its current width, its capacity would be increased but would be much less than the planned project.

11. Comment Summary: According to Watershed Memorandum 108, channel work should be only a supplement to floodwater retardation. Were floodwater retarding structures eliminated because of excessive relocation costs?

Response: The first increment in any PL-566 watershed project is conservation land treatment. The second increment is the identification and evaluation of physically potential floodwater retarding structures. The last increment considered is channel work. Floodwater retarding structures were considered and are described on page 35.

12. Comment Summary: Channel work drastically reduced wood duck nesting population on Crow Creek according to a five-year study by the Alabama Department of Conservation and Natural Resources.

Response: The second year after channel work was completed on Crow Creek the wood duck population in the area was at an all-time high. Banding results increased almost 1,000 percent over the previous year. The investigation concluded that channel work had little effect on the wood duck nesting success in Crow Creek Watershed.

13. Comment Summary: What effect will channel work have on the Tuscumbia Darter?

Response: Channel work would disturb their habitat if they exist in Swan Creek where channel work is planned. The statement reflects this on page 30.

14. Comment Summary: Could any of the project area be included in the Water Bank Act, Public Law 91-559?

Response: The Water Bank Act of 1970 gave the Secretary of Agriculture authority to formulate and carry out a continuous program to prevent the serious loss of wetlands (types 1 through 5 described in Circular 39, Wetlands of the United States, by the United States Department of Interior) and to preserve, restore, and improve such lands. No wetlands of these types exist within Swan Creek Watershed.

15. Comment Summary: Suggestion was made that the statement should include comments from the University of Alabama, Museum of Natural History concerning archaeological or scientific values within the watershed.

Response: Concur - A statement has been added, see page 11.

16. Comment Summary: Will the project increase flooding and flood damages downstream?

¹ Alabama Department of Conservation and Natural Resources, Annual Progress Report-Federal Aid in Wildlife Restoration, October 1, 1971-September 30, 1972.

Response: The drainage area on the Tennessee River at Decatur is listed as 26,900 square miles by the U. S. Geological Survey and 29,590 square miles at Wheeler Dam. Swan Creek represents about 0.2 percent of the Tennessee River drainage area at Wheeler Dam. Because of this, together with the large surface area of Wheeler Lake, there will be no measurable increase in downstream flooding.

ALABAMA SPORTSMAN CONSERVATION CLUB

1. Comment Summary: The Alabama Department of Conservation and Natural Resources was not asked to reply on the draft environmental statement.

Response: Comments from state agencies are requested through the Alabama state clearing house (Alabama Development Office) in accordance with Office of Management and Budget Circular A-95.

2. Comment Summary: The Alabama Division of Forestry was not asked to reply on the draft statement.

Response: See comment 1 above. Also, the U. S. Forest Service works closely with the Alabama Division of Forestry on all PL-566 watershed projects in Alabama.

3. Comment Summary: It is inconceivable to pay a landowner for an easement on the spoils area, and then only allow reforestation at the landowner's option.

Response: Many of the landowners were contacted about planting trees on the spoil banks. All expressed a willingness and the type of trees desired. Plans have been developed for planting trees and will be contracted for installation.

4. Comment Summary: Who makes estimates used in work plans and environmental statements and what is basis for these estimates?

Response: Estimates referred to are usually made by the staff of the Soil Conservation Service and U. S. Forest Service. These staffs include trained agronomists, biologists, engineers, economists, foresters, geologists, hydrologists and soil scientists. In instances where information is provided by another source it is footnoted.

5. Comment Summary: There appears to be sufficient vegetation to keep the delicate ecological balance in check, as far as silt entering the Tennessee River is concerned.

Response: Measures to prevent or lessen possible adverse effects on the environment are described on page 21.

6. Comment Summary: The cost/benefit ratio is grossly exaggerated to provide justification rather than present all the facts.

Response: Standard procedures were followed in evaluating the benefits and costs for determining the justification of the project. These procedures are in accordance with accepted procedures for evaluating water and land resource projects of this nature.

7. Comment Summary: Proper sewage treatment facilities in the city of Athens, for which plans have already been made, would greatly enhance present land, wildlife, and recreational values.

Response: Concur.

8. Comment Summary: All channel work should be blocked and money for this project should be transferred to the sewage treatment plant for the City of Athens.

Response: The Soil Conservation Service does not have the authority to transfer money as stated. The project planned is in compliance with provisions of the Watershed Protection and Flood Protection Act, as amended, PL-566. Grants are available for sewage treatment from other governmental departments.

THE ALABAMA CONSERVANCY - BIRMINGHAM, ALABAMA

1. Comment Summary: The statement is equating erosion with sedimentation by showing a 27 percent reduction in erosion and a 27 percent reduction in sedimentation.

Response: Sediment is the product of erosion; and therefore, a reduction in erosion produces a corresponding reduction in sedimentation. This has been proven in over ten thousand plot years of research at soil erosion test plots¹ and in hundreds of recurring reservoir sediment surveys.²

2. Comment Summary: The statement does not mention the drastic increase in sedimentation during channel construction.

Response: Sedimentation will increase during construction, however, measures to prevent or lessen possible adverse effects on the environment will be utilized. These are described on page 21. This effect is noted in the final environmental statement.

3. Comment Summary: "Appropriate vegetation" that will minimize erosion is not stated as to type.

Response: The statement has been modified, see page 20.

4. Comment Summary: No type of vegetation except root armor of bottom land trees can stabilize the channel bank.

Response: Provisions for minimizing erosion and stabilizing the channel banks are described on page 21. The types of grasses to be established on the channel banks and rock riprap in selected areas are also effective means of stabilizing channel banks.

5. Comment Summary: The statement is vague about trees being planted on the spoil area "where agreed to by landowners".

Response: The "Planned Project" section was modified to show that landowners have agreed to the tree plantings and what tree species will be planted, see page 20.

6. Comment Summary: Although the planned excavating in reaches may retard downstream sedimentation for a time when the unexcavated areas are channeled, sediment will move downstream unchecked.

¹U. S. Department of Agriculture, Agricultural Research Service, and Purdue University, 1965. Agriculture Handbook No. 282, Predicting Rainfall Erosion Losses from Cropland East of the Rocky Mountains.

²U. S. Department of Agriculture, Miscellaneous Publications, various numbers, Summary of reservoir sediment deposition surveys made in the United States, Washington, D. C.

Response: The first excavation will represent about 75 percent of the total length of the channel work. When the unexcavated sections are removed, the majority of the sediment produced by the project will have already been trapped. This trapped sediment along with the unexcavated sections will then be removed.

7. Comment Summary: The statement does not give enough information about sediment traps.

Response: The statement has been modified to include this information, see page 21.

8. Comment Summary: Pools behind rock areas designed to restore fish habitat will fill with sediment just as sediment traps will become filled.

Response: Sediment traps will function only during construction. The traps will fill with coarse-grained bed material within a year or two but will have served their purpose by that time.

The pools created by rock ledges above grade are not intended as dams to trap sediment. They will create turbulence or high velocities that will scour holes and throw up gravel bars downstream from the rock, thus tending to naturalize the stream.

In summary, the rock ledge-pools will only begin forming after construction while the slack water sediment traps will have already served their purpose by the end of construction.

9. Comment Summary: The statement that excavation will be done from one side "where practical" is vague and valueless.

Response: Final channel designs show that approximately 25 percent of channel work will be done by excavation from one side of the existing channel.

10. Comment Summary: Channel work will increase sedimentation to a far greater extent than the land treatment measures will decrease it.

Response: The channel is designed for non-scouring velocities in the newly dug "as-built" condition according to USDA-SCS Technical Release No. 25, "Planning and Design of Open Channels". In addition, measures described on page 21 will prevent or lessen possible adverse effects on the environment.

11. Comment Summary: There is no guarantee that the landowners will fulfill their land treatment agreements.

Response: Public Law 566 has no guarantee for the installation of planned land treatment measures. However, many of the PL-566 watershed projects in Alabama show that the land treatment installed exceeded the amounts planned.

12. Comment Summary: Increased sediment derived from the channel work will contribute to eutrophication and aggravate the aquatic weed problems already present in Wheeler Reservoir.

Response: There will be a temporary increase in sediment movement during project installation as pointed out in the statement. However, the long-term effect of the project will be a reduction in downstream sedimentation.

13. Comment Summary: Since Swan Creek receives the effluent from Athens sewage treatment plant, the downstream problems of too much nutrient enrichment will be further aggravated. The detoxification and pollutant-absorbing capabilities of natural streams are well known. Channelized streams lack these features. In this project, after construction, the pollutants from Athens and other damaging elements such as pesticides and fertilizers will be flushed downstream more rapidly and in higher concentrations.

Response: The pollutant-absorbing capabilities of Swan Creek will be altered with the planned project. In addition, the channel has been designed to remove floodwater within established velocities. If pesticides, effluent, fertilizer or other nutrients reach the improved channel they will move downstream more rapidly during flood periods.

14. Comment Summary: The increase in sediment induced turbidity is mentioned only as it relates to construction.

Response: Increased turbidity will only exist during and immediately following the construction phase.

15. Comment Summary: The project will increase flooding problems in the mouth of the creek and in the impounded Tennessee River.

Response: The flood plain area at the mouth of Swan Creek is entirely in bottom land hardwoods. The increase in flood stages will be small as shown on page 51, response 7. Also, the Swan Creek drainage area represents about 0.2 percent of the Tennessee River drainage area at Wheeler Dam.

16. Comment Summary: No mention is made as to how reforestation of 222 acres of land cleared for project installation will be accomplished, what tree species will be removed, or what species will be restocked.

Response: The tree species to be restocked are described on page 20 and the tree species that will be removed are described on page 9.

17. Comment Summary: The project will reduce hardwoods which are already in short supply; the original forest type cannot be replaced by succession.

Response: Land use changes will reduce hardwoods within the watershed area. According to Forest Statistics for Alabama Counties by the U. S. Forest Service, hardwoods have increased during the past ten years. In 1972 Alabama had approximately 13.5 million acres of hardwoods compared to about 12.3 million in 1963.

The bulk of the forest acreage that will be affected by succession will be that just above Wheeler Reservoir. This area has resulted in a wetter forest cover type than that originally in the Swan Creek drainage area. For example, while the original type was probably sweet gum - nuttall oak - willow oak with a preponderance of willow oak, the present forest cover type is the same type, but now includes considerably more sweet gum and willow oak, largely due to the fact that it has been cut over, and the fact that it has become wetter than it was originally. The hackberry-American elm-green ash type probably had more oak in it than it does presently where hickory and willow oak predominate.

18. Comment Summary: Most land treatment measures on forest land will not be done, since it is up to the landowners to install them.

Response: See Comment No. 11, page 58.

19. Comment Summary: Forest improvement cutting is not a beneficial land treatment measure, this measure will actually increase erosion.

Response: Improvement cutting as a technique to improve the forest and forest floor conditions has been among silvicultural practices applied successfully.

20. Comment Summary: Increased sediment in the water will be detrimental to stream wildlife habitat.

Response: Concur - Measures to prevent or lessen adverse effects on the environment are described on page 21.

21. Comment Summary: "Forest improvement cutting" will cause the removal of den trees or mast trees.

Response: Watershed forest management plans prepared under the accelerated forest management program are designed not only to improve the watershed conditions, but especially to develop a better forest wildlife habitat. Den trees, mast

trees and potential den trees are recognized and identified. In addition, forest management plans prepared under this accelerated program are directed toward producing and maintaining the more stable forest cover types - those types that better lend themselves to multi-objective management.

22. Comment Summary: Clearing and snagging within the Swan Creek Wildlife Management area will reduce available substrates on which food organisms develop.

Response: This effect is expected to be temporary. As the channel bottom shifts or lowers, additional substrate material on which food organisms develop will be exposed.

23. Comment Summary: Number, size, type, and location of ponds is not included in the statement.

Response: The size and location of the ponds is not known. However, these ponds are expected to be small. Most will have a surface area from 2-5 acres. The exact locations are not known but will be determined during the development of conservation plans for the individual landowners. They are not expected to have a major impact on the wildlife resources.

24. Comment Summary: Damages to birds that feed in wet areas are not mentioned.

Response: Reduction of floods was not used to claim increased benefits to certain birds. It is recognized that installation of the planned project will result in a loss of some wildlife habitat. Provisions to minimize this are described on page 21. Also, landowners are being encouraged to improve wildlife habitat, see page 18.

25. Comment Summary: The increased turbidity, increased sedimentation, increased water temperature, and flushing of increased nutrients and pollutants downstream will have a serious effect on the fishes inhabiting Swan Creek and the adjacent portions of Wheeler Reservoir.

Response: Provisions to prevent or lessen possible adverse effects on the environment are described on page 21.

26. Comment Summary: Construction of ponds to mitigate stream fishery damages is ridiculous.

Response: Ponds are not planned as a mitigation measure but rather as a conservation land treatment measure.

27. Comment Summary: Will ponds built with public assistance be open to the public?

Response: Ponds will be constructed by private landowners. Technical assistance will be available on request from the Soil Conservation Service through the Limestone County Soil and Water Conservation District. These ponds will not be open to the public unless the private owner desires to do so.

28. Comment Summary: The deepened centerline to provide fish passage during dry periods will fill with sediment and become functionless.

Response: Concur - The deepened centerline will provide fish passage during the establishment period of the channel. It will largely fill with sediment, but by this time the channel is expected to have stabilized and vegetation will have become established on the channel banks.

29. Comment Summary: Notropis boops has been omitted from the list of rare and endangered species.

Response: This species is included in the final statement.

30. Comment Summary: No mention is made of any rare or endangered invertebrates.

Response: No rare and endangered invertebrates are known to exist in the Swan Creek stream system.

31. Comment Summary: Construction workers are not qualified to evaluate or recognize archaeological, scientific, or historical materials.

Response: The Alabama Historical Commission will be notified when construction is to begin. Efforts will be made during construction to keep appropriate state and federal officials informed of progress.

32. Comment Summary: Could the three potential sites listed in the "Appraisal of Potential for Outdoor Recreation Development" not be used for floodwater retarding structures?

Response: The sites involve relatively small watersheds and would have negligible flood retarding effects and therefore could not be used for floodwater retarding structures. On page 35, three floodwater retarding structures were evaluated as an alternative.

33. Comment Summary: What would effects be if these three structure sites were used in combination with land treatment?

Response: The three structure sites evaluated would have a limited effect on reducing flood damages, see page 35.

34. Comment Summary: Alternative of combining land treatment measures with purchase of low-lying portions of the flood plain was not considered.

Response: The purchasing of low-lying portions of the flood plain was not considered to be a reasonable alternative. Purchasing would involve displacement of present occupancy and disturb the social and economic fabric of those affected. It would affect approximately 174 land-owners.

35. Comment Summary: Alternative of using some funds to construct better flood-resistant bridges was not considered.

Response: Road and bridge damages represent only a small portion of total flood damages (\$490). Many of the bridges will be altered with the planned project.

36. Comment Summary: Alternative of purchase of all-risk crop insurance by the sponsors was not considered.

Response: Concur - all-risk crop insurance is available in Limestone County for cotton and soybeans with the Federal Crop Insurance Corporation. However, areas subject to severe flooding, such as the Swan Creek flood plain, is not insurable by this agency. Also, crop insurance does not offer any flood protection or damage reduction and therefore was not considered a reasonable alternative to planned structural measures.

37. Comment Summary: The statement does not consider the alternative of clearing and snagging throughout the length of the project rather than just in the wildlife management area.

Response: This alternative is included in the final environmental statement, see page 38.

38. Comment Summary: A workable program might be a combination of land treatment, with bridge and roadfill improvement, with some snagging, with some flood plain zoning, with some land purchase, with some crop insurance.

Response: Several facets of this program are described in the alternatives section, pages 33-37. The other facets were considered but dismissed.

39. Comment Summary: This project in combination with others will flush additional waters into the Tennessee River and aggravate the flooding that is already too much for TVA measures to handle.

Response: Swan Creek represents only 0.2 percent of the drainage area at Wheeler Dam. It is expected to have an insignificant effect on waterflow in the Tennessee River.

40. Comment Summary: This project in combination with others will contribute to eutrophication and destruction of the aquatic resources of the Tennessee River by flushing sediment fixed nutrients, fertilizers, and pesticides into the pooled areas of the river.

Response: Measures to prevent or lessen adverse effects on the environment are described on page 21. Also, see comment 2, page 48.

41. Comment Summary: Reducing annual erosion and sedimentation is untrue since it has been repeatedly shown that channelization increases erosion and sedimentation.

Response: Measures to prevent or lessen adverse effects on the environment are described on page 21. The reduction in erosion and sedimentation is primarily from the application of conservation land treatment measures and using the land within its capabilities.

42. Comment Summary: Providing a more uniform flow is untrue since channelization increases high flows and decreases low flows.

Response: It is true the high flows will be increased with the planned project. The land treatment program will improve the water holding capacity of the soil with a resultant effect of a more uniform base flow. The planned project is not expected to increase or decrease the average annual runoff.

43. Comment Summary: Small pools in the artificial channel will provide myriads of mosquito breeding sites during low flow times. Predators to reduce mosquito larva populations will be lacking.

Response: The project will create a more uniform base flow and should reduce mosquito breeding areas. During extreme low flows, pot holes may form in the channel but predators would not be lacking especially after vegetation has been established.

44. Comment Summary: Water quality will not be improved because the project will cause an increase in sediment, turbidity, and pollutant runoff.

Response: Temporarily, these effects will be increased by the channel work as stated in the statement. However, mitigation measures described in the statement will hold these effects to a minimum.

45. Comment Summary: The hydrologic conditions of forest soils, especially bottom land areas, will not be improved because bottom land species must have wet soils and flooding to survive.

Response: Forest land treatment measures will improve the hydrologic conditions by building up humus layers and water holding capacity of the forest soils. Also, flooding will not be totally eliminated, there will still be out-of-bank flow during the larger floods.

46. Comment Summary: Forest fire protection and farm pond fishery can be increased without the project. Increased farm pond fishery is unnecessary.

Response: True, they could be provided without the project but it is unlikely that this would be accomplished under going programs. The proposed watershed project is specifically designed to accomplish these goals. Farm pond fishery is considered to be necessary and increasing this fishery is therefore a favorable effect.

47. Comment Summary: Improving the nesting success of ground nesting birds is childishy absurd since it entails drying up wetland and destroying the habitats of wetland species to increase the habitat for animals already in abundance.

Response: Improving the nesting success of ground nesting birds has been omitted from the list of favorable environmental effects. The habitat for wetland species, however, will not be destroyed; it will be adversely affected during construction.

48. Comment Summary: Create employment, improve local economy, and improve transportation systems could all be accomplished without the project.

Response: The planned project will favorably affect employment, the local economy, and transportation systems in the watershed. It is questionable that other projects or programs could provide identical benefits and do the same beneficiaries as the planned project.

49. Comment Summary: The project will result in the destruction of Swan Creek as a natural laboratory and recreational area for college and high school students.

Response: Swan Creek above the L & N Railroad near the Wildlife Management Area would serve as a poor laboratory due to its pollution. Also, Swan Creek as a recreational resource is poor due to a low value of fishery resource and poor water quality.

50. Comment Summary: The project could possibly cause damage to the ground water level.

Response: The ground water levels could possibly be increased from application of conservation measures which would improve the water holding capacity of the soil and the use of the land within its capabilities.

51. Comment Summary: The statement does not mention the ultimate degeneration of bottom land soil fertility in the areas of reduced flooding.

Response: Flooding will still occur even with the planned project, see page 26. It is not anticipated that soil degeneration will be even a slight problem.

52. Comment Summary: Monetary data are not complete enough to enable project evaluation.

Response: Economic data appears on pages 7, 8, 15, 16, 17, 22, and 26.

53. Comment Summary: Effects of increase in stream temperature were not mentioned.

Response: These possible effects are discussed in the final statement, see page 30.

THE ALABAMA CONSERVANCY - HUNTSVILLE CHAPTER

1. Comment Summary: The Alabama Department of Conservation and Natural Resources was not requested to comment on the draft impact statement.

Response: Comments from this agency and other state agencies were requested through the Alabama Development Office, see page 54, comment summary #1.

2. Comment Summary: Lack of local support is exemplified by only 52 percent of watershed, less urban areas, being covered by agreements and only 37 percent of landowners being cooperators.

Response: Numerous public meetings have been held since the watershed was approved for planning on October 24, 1966. Input from many federal, state, and local agencies has been made as well as individual landowners in the watershed.

3. Comment Summary: It is not sufficiently explained how indirect flood damages can be \$4,383 while direct road and bridge damage is only \$490.

Response: The statement includes additional explanation, see page 16.

4. Comment Summary: Using information from Swan Creek and Mallard-Fox Creek Wildlife Management Areas is questionable.

Response: This data is presented to merely reflect relative hunting pressures on managed, public hunting areas around the watershed.

5. Comment Summary: The low value of the stream fishery is due to pollution not to physical attributes of the stream.

Response: Pollution abatement would increase the fishery resource value. However, even with pollution abatement, it would still be expected to have a low value except in the backwaters of Wheeler Reservoir in the extreme lower end.

6. Comment Summary: No adverse effects on vertebrates classed Rare-1 and Rare-2 is totally unsubstantiated.

Response: The planned project could have an adverse effect, see page 30.

7. Comment Summary: Inclusion of farm pond fishery, creation of employment, improvement of local economy, and improvement of transportation systems under favorable environmental effects is questionable.

Response: None.

8. Comment Summary: The increase in stream temperature is understated.

Response: See page 30.

9. Comment Summary: The loss of streambank wildlife food and cover will last considerably longer than the construction period.

Response: Concur. The adverse effect on fish and wildlife habitat should be limited to that amount of terrestrial habit necessary to enlarge or realign the channel. The stream which has been characterized as having a low fisheries value by the Department of Conservation and Natural Resources should regain its existing carrying capacity in five to fifteen years. Adverse effects of the project on the aquatic environment both onsite and downstream are anticipated to be insignificant after the above mentioned time frame.

10. Comment Summary: The statement contradicts the work plan in regard to why floodwater retarding structure sites were not available.

Response: The alternative of conservation land treatment and floodwater retarding structures is described on page 35.

11. Comment Summary: Other alternatives should have been considered.

Response: Additional alternatives are discussed on pages 34-38.

12. Comment Summary: Only 70 percent of flood plain would have to be purchased since only 70 percent flood protection is provided by the proposed project.

Response: Average annual flood damages will be reduced 72 percent by the planned project. It is estimated that there will still be one flood occurrence during the cropping season and one flood occurrence during the winter even with the project, see page 26.

13. Comment Summary: The project will result in the destruction of 12 miles of stream.

Response: The stream will be damaged during and immediately following construction as pointed out in the statement. Measures to prevent or lessen adverse effects on the environment are described on page 21.

14. Comment Summary: No consideration is given the beneficial effects of flooding such as flood plain soil enrichment.

Response: Flooding will still occur even with the project, see page 26. It is not anticipated that soil degeneration will even be a slight problem.

15. Comment Summary: No mention is made of the loss in scenic value to persons living near the stream.

Response: Installation of the project will have an effect on the aesthetics of the area. This effect will be different for each individual observing the area.

16. Comment Summary: Benefits claimed in the impact statement are greater than those claimed in the 1968 work plan.

Response: An addendum to the work plan was prepared in November 1969 to reflect a $4\frac{7}{8}$ percent interest rate and added more intensive land use benefits. Changes in benefits came as a result of this addendum. This addendum is available on request from the Soil Conservation Service Office in Auburn, Alabama.

17. Comment Summary: Loss of revenue from hunting and fishing is not mentioned.

Response: The fishing and wildlife resources are of low value outside the management area. The overall reduction in the utilization of these resources by hunting and fishing should be insignificant.

18. Comment Summary: No justification of the 100-year project life is made in the impact statement.

Response: The project is evaluated over a 100-year life. To assure the proper functioning of the project throughout its life, an operation and maintenance agreement will be signed between the Limestone County Commission and the Soil Conservation Service, see pages 24 and 25.

19. Comment Summary: The use of tables to summarize project figures would be helpful.

Response: Concur. More information is presented in tabular form in the statement.

BRADLEY, ARANT, ROSE AND WHITE

1. Comment Summary: Failure to obtain or set forth adverse comments and views of National Water Commission.

Response: The draft statement was transmitted to the federal, state, and local agencies as required by the Council on Environmental Quality and to the public as provided by Section 552 of Title 5 United States Code.

2. Comment Summary: The statement cites more intensive farming practices and increased agricultural production as a prime or principal benefit. This is contrary to the National Water Commission policy which discourages bringing additional agricultural land into production.

Response: It is not expected that additional agricultural land will be brought into production. See page 27 for a discussion of the project benefits.

3. Comment Summary: Complete absence of financial information used to determine benefit-cost ratio.

Response: The statement has been modified to provide more information about costs and benefits.

4. Comment Summary: Use of Unrealistic Discount Rate and Project Life.

Response: An addendum was prepared in November, 1969, updating the interest rate to $4 \frac{7}{8}$ percent interest. Any interest rates used in project development is in accordance with Title 18--Conservation of Power and Water Resources, Chapter VI, Part 704--Plan Formulation Standards and Procedures, paragraph 704.39 subparts a. and b. These guidelines are contained in the Plan Formulation Standards and Procedures section of the Water Resources Council Handbook.

The period of evaluation used in project analysis is based on the expected useful economic life of the project or a period of 100 years, whichever is less. Project life is in accordance with paragraph 102.0211 of the Watershed Protection Handbook, which is consistent with current established policy of the Water Resources Council.

5. Comment Summary: Total damages are different in the environmental statement from that in the original work plan.

Response: An addendum to the work plan was prepared in November 1969, which changed damages, benefits, cost, and raised the interest rate to $4 \frac{7}{8}$ percent. This addendum was prepared in compliance with Watershed Memorandum 92 and Title 18, Chapter VI, Part 704 subparts d. and e. of the Water Resources Council Guidelines. Copies

of the addendum are available on request at the Soil Conservation Service Office in Auburn, Alabama.

6. Comment Summary: The project will increase erosion and siltation rather than reduce it. Revegetation of the banks with grasses or other plants cannot replace the strength of root systems of trees for erosion protection.

Response: Measures to prevent or lessen adverse effects on the environment are described on page 21. Also, the channel is designed according to sound hydraulic and engineering principles to minimize erosion during and immediately after construction. Revegetation of the banks and spoil banks will be with grasses and trees.

7. Comment Summary: There is inconsistency between alternative of conservation land treatment measures without channel work and effects of land treatment measures discussed in impact section.

Response: Efforts have been made to clarify any inconsistencies in the final statement.

8. Comment Summary: Flood problems will be created in the wildlife management area where the stream channel will have a bottom width of 40' - 60' as opposed to a bottom width of 90' just above it.

Response: Floodwater elevations will increase slightly below the end of the excavated channel, see comment 7, page 51.

9. Comment Summary: The number of times that flooding occurs during the cropping season is not consistent with the fact that most flooding occurs during the months of February and March.

Response: Information about when floods occurred was obtained from landowners as well as Climatological Data from the U. S. Department of Commerce, National Oceanic and Atmospheric Administration.

10. Comment Summary: Will hardwood and pine stands be converted to pure pine monoculture? If so, what affect will this have on wildlife habitat?

Response: The only forest stands that will be converted will be on the 300-acres of forest land that is cleared for project installation. Seventy-eight of these acres will be occupied by the planned channel and the remaining 222 acres will be planted to trees (pecan, poplar, walnut and

saw-tooth oak). The final statement is modified to reflect these tree species and their effect on woodland wildlife habitat.

11. Comment Summary: It is not emphasized that Limestone County ranks last in the state in acres of forest land.

Response: It is a historical fact that Limestone County is the most sparsely forested county in Alabama. In the last ten years, forest acreage has shown a 20 percent reduction from 98,000 acres in 1963 to the present commercial forest acreage of 77,900 acres.

12. Comment Summary: The statement does not state what type of trees will be replanted on the areas that are cleared for project installation.

Response: The statement was modified to include tree species to be planted, see page 20.

13. Comment Summary: The statement does not explain the means by which the project will be maintained.

Response: The statement includes a section on "Operation and Maintenance", see pages 24 and 25.

14. Comment Summary: Mitigation measure No. 4 is mere speculation since nowhere does the statement set forth if the landowners will do this or any means for enforcing that that will.

Response: Planting of trees in the spoil areas will be contracted along with the channel work.

15. Comment Summary: The statement is in error by stating that no sites for floodwater retarding structures are available. These sites are available but would require relocating a portion of the L&N Railroad or a highway.

Response: The alternative of conservation land treatment and floodwater retarding structures is described on page 35.

16. Comment Summary: Suction pumps to remove sediment from the stream bottom should be considered as an alternative to channel work.

Response: See Comment No. 10, page 52.

17. Comment Summary: The use of hand labor under the supervision of biologists to remove sediment from the stream and restore the natural streambed should be considered in the alternative section.

Response: The combination of the high cost of labor and the relatively low rate of productivity of hand tools prohibits any serious consideration of using hand labor to clean out the channel.

18. Comment Summary: The project will not increase the number of ground nesting birds mentioned in the statement. This should not be claimed as a favorable environmental effect.

Response: Concur.

19. Comment Summary: The project will adversely affect the habitat of the Tuscumbia Darter.

Response: Channel work would disturb their habitat if they exist in Swan Creek where channel work is planned.

20. Comment Summary: If runoff from the watershed is accelerated, scientific data shows that this will have an adverse effect on soil fertility.

Response: Surface runoff from the watershed will be reduced - not accelerated - by the conservation land treatment measures.

21. Comment Summary: Additional employment created by the project is not a significant benefit to be derived from channel work.

Response: Swan Creek Watershed lies within the economically depressed Appalachian Region and is, therefore, eligible for redevelopment benefits derived from increased employment opportunities for local people. Additional employment created by the project is not expected to be significant.

CITIZENS TO SAVE SWAN CREEK

1. Comment Summary: A Tennessee Valley Authority flood plain survey on Town Creek (a Swan Creek tributary) did not recommend channelization of Swan Creek.

Response: The purpose of this study was to "provide basic information on floods that have occurred or may occur which would be helpful in the state and local programs of city planning and development in Athens". The study was not intended to recommend channel work or any other corrective measure.

2. Comment Summary: Population encroachment cannot be used as rationale for channelization.

Response: Population encroachment was not used as a basis for determining the need for channel work. Residential encroachment into the flood plain was mentioned in an effort to more accurately describe the urbanized portion of the watershed. Channel work on Swan Creek is not intended to make land suitable for nonagricultural development.

3. Comment Summary: Channelization cannot be used to bring new land into agricultural production.

Response: New lands will not be brought into agricultural production by the project. Some cropland will shift from the uplands into the flood plain after flood protection is realized. The impact section was modified to show that the net change in land use would not increase total cropland in the watershed.

4. Comment Summary: A complete ecological survey of the entire Swan Creek flood plain is necessary for a meaningful impact statement. Additional fish species are listed as existing in Swan Creek.

Response: Additional data has been included in the Environmental Setting section of the impact statement.

5. Comment Summary: Hunting and trapping data from Mallard-Fox Creek Wildlife Management Area is not valid because it is located across Wheeler Lake, a distance of about four miles away.

Response: The data are presented merely to reflect relative hunting pressures on managed, public hunting areas in and around the watershed.

6. Comment Summary: If flooding at the Town Creek-Swan Creek confluence causes flooding $1\frac{1}{2}$ miles back, then the Tennessee River impoundment in Wheeler Reservoir should cause flooding of the entire North Alabama region.

Response: None.

7. Comment Summary: "High" expense for road and bridge maintenance is questioned since Table 5 shows an average annual road and bridge damage of only \$490. Also reduced road and bridge maintenance helping to provide a higher standard of living is questioned.

Response: Elimination of road and bridge damages will mean that much more money will be available for other purposes.

8. Comment Summary: Less delay at harvest time must be countered by dry conditions prevailing from midsummer to late fall.

Response: Dry conditions may prevail from midsummer through late fall. Soybean and cotton harvest, however, extends from late October through December. Wet conditions have occurred, especially in late November and December, that have caused damages to soybean and cotton quality and delayed harvest out into the flood prone months of January and February.

9. Comment Summary: Concern was expressed relative to the project allowing some farmers to stay in business since one particular farmer in the watershed recently received large crop subsidies.

Response: The planned project will provide opportunities for landowners to improve farm income. This could encourage some landowners to continue in farming.

10. Comment Summary: Channelization does not offer a correction to the pollution problems of Swan Creek except to hurry it away.

Response: Channel work is not designed to be a correction to the pollution problem.

11. Comment Summary: If the "modified channel" is to be 90 feet wide in the lower reach, how then will a channel 40 to 60 feet wide, cleared and snagged, in the Swan Creek Wildlife Management Area, into which the 90 foot channel flows be adequate?

Response: This clearing and snagging has been changed to clearing and shaping. This means that sand bars, logs, and debris will be removed from the stream. There will be out-of-bank flow in this area during heavy rains but a better outlet will be provided for upstream channel work. See Comment 7, page 51.

12. Comment Summary: Encouragement of flood plain zoning is questioned. Comment is made that the local people ignored a flood plain survey of Limestone County.

Response: Zoning of the flood plain could be effective in minimizing future potential flood damages. The TVA "flood plain survey" was a report on past and expected future flooding on Town and Swan Creeks. The "Environmental Impact"

section of the statement was modified to show that the Soil Conservation Service will provide the sponsors technical information about the flood hazard area on request.

13. (A) Comment Summary: Reduction of erosion and sedimentation is questioned since there will be increased row crops in the flood plain.

Response: As pointed out in the impact statement, conservation land treatment measures and land use changes will result in a 27 percent reduction in net erosion from the watershed. It should be pointed out that a change from pasture or woods to row crops in the flood plain will result in increased erosion on those acres. This will be offset, however, by changes in upland cropland to pasture. Simply moving an acre of upland crops to the flood plain would effect about a 10 to 1 reduction in erosion on an acre for acre basis.

- (B) Comment Summary: Comment is made questioning improvement of the forest hydrologic condition.

Response: The hydrologic condition of bottom land hardwoods will not be improved but the replanting will protect the soil until the ecological plant succession can renew the present hydrologic conditions. The upland tree planting and stand improvement measures will improve the hydrologic condition by adding to the humus layers and retarding runoff. The net effect will improve the overall hydrologic condition as pointed out in the final statement.

14. Comment Summary: Comment is made that Indian artifacts would make the area have archaeological value.

Response: The "Environmental Setting" section has been revised to show comments from the University of Alabama, Museum of Natural History in regard to archaeological sites of value.

15. Comment Summary: Comment was made that there was an error in calculating the land dedicated to the modified channel.

Response: The "Impact" section was modified to explain that the 79 acres is not the total area occupied by the proposed channel. The 79 acres is additional land that will be occupied by the channel.

16. Comment Summary: It is stated that aesthetic values from the viewpoint of homeowners along the creek have not been considered.

Response: Indication is made here that several expensive homes were built or bought along Swan Creek because of the aesthetic appeal. Three homeowners in the Hightower subdivision have homes on the east branch of Swan Creek. On March 16, 1973, one of these homeowners had 11 inches of floodwater in the living area. Another house had water up to the floor level. The third house was completely surrounded by water causing excessive damages to heating and air-conditioning systems.

SIERRA CLUB

1. Comment Summary: The project will permanently adversely affect wildlife habitat.

Response: See Comment No. 9, page 67.

2. Comment Summary: Alternatives are not complete.

Response: Additional alternatives are discussed in the final impact statement, see pages 34-38.

3. Comment Summary: The State Department of Conservation and Natural Resources was not provided a draft impact statement for comment.

Response: Comments from this agency and other state agencies were requested through the Alabama Development Office.

4. Comment Summary: The concerned U. S. Congressman should receive a copy of the draft statement.

Response: National Environmental Policy Act guidelines were followed in draft impact statement distribution.

5. Comment Summary: Changed land use should be incorporated in the "purpose" of the statement.

Response: Changed land use is not a purpose of the project. It will occur as a result of the project however, and is discussed on page 27.

6. Comment Summary: A reference to the definitive measure planned should be included.

Response: The "Planned Project" section has been expanded to give more information on planned measures.

7. Comment Summary: Is it intended to provide required time for study and retrieval of artifacts?

Response: If artifacts are uncovered time will be provided for their removal.

8. Comment Summary: Are there any other significant sources of pollution that should be addressed?

Response: None.

9. Comment Summary: Is it planned to regulate agricultural applications of pesticides, herbicides, and fertilizers?

Response: Farmers will be encouraged to use these chemicals according to instructions on the label or from the manufacturers representative.

10. Comment Summary: The desirability of limiting mosquito population is not addressed.

Response: Concur. The problem of mosquito control is not widespread nor a serious problem in the watershed.

11. Comment Summary: The notation that the landowners' permission is required to plant trees that may be essential to protection of stream values is alarming.

Response: Trees will be planted according to design specifications and installed by means of a contract. Tree species are shown on page 20.

12. Comment Summary: The stream should not be thought of as a sediment trap or sediment accommodator. If sedimentation is a problem it must be slowed by measures designed to hold the soil in place.

Response: Concur. Holding the channel soil in place will be accomplished by channel design features and vegetation, as described on page 21.

13. Comment Summary: The deepening of the centerline neighborhood will have hydraulic consequences that may be good or bad but the net result is a modification of an assumed stable system.

Response: The planned project will modify the existing stream system. To assume a stable system is questionable.

14. Comment Summary: What are criteria used in making a decision to leave vegetation on one side of the stream intact.

Response: There are no set criteria for leaving vegetation on one side. This is done in an effort to minimize adverse effects on the environment.

15. Comment Summary: In the statement "Proper application of fertilizers, pesticides, and other chemicals will be stressed", the word proper should be qualified.

Response: Proper application will be following directions and labels on containers. Soil tests will be helpful in determining proper applications of fertilizers as to rates, analysis, and time of application.

16. Comment Summary: The mechnaism for discouraging residential and commercial development of the flood plain after project installation should be more fully discussed.

Response: This is included in the final statement, see page 22.

17. Comment Summary: To what extent does the changed land use predicted to occur increase runoff and erosion and thus stand in support of channelization?

Response: Land use changes along with land treatment will decrease rather than increase runoff and erosion.

18. Comment Summary: The fact that 80,000 tons of soil are estimated to be lost after channelization supports the contention that in terms of soil retention the project is of little consequence.

Response: The fact that 110,250 tons of sediment are lost annually without the project is significant. The net annual saving of 30,250 tons of sediment entering Wheeler Reservoir is considered to be significant.

BOB TRUETT

1. Comment Summary: Benefit-cost ratio would probably be unfavorable if redone using realistic interest rates and realistic benefit figures.

Response: A benefit-cost ratio based on 1973 prices and $6 \frac{7}{8}$ percent interest is shown on page 22.

2. Comment Summary: The cost of the project is to be paid by the U. S. Taxpayer in general while benefits go to a limited number of local people.

Response: The Appalachian Region of the United States (of which Swan Creek Watershed is a part) has been determined to be an economically depressed area by the United States Congress. The Swan Creek Watershed project is one means of improving this economically depressed area. Also, the landowner receiving flood benefits will have additional money to buy more fertilizer, update his farm machinery, improve his style of living, increase his production and many other items. These all put money into circulation which creates more employment opportunities.

3. Comment Summary: Flood damages could be totally eliminated by purchasing only 68 percent of the flood plain since 32 percent is occupied by forest land, and might very well cost less than the project.

Response: Average annual flood damages will be reduced 72 percent by the planned project. It is estimated that one flood will still occur during the cropping season and one during the winter even with the project, see page 26.

Purchasing of the land would involve displacement of present occupancy and widespread adjustments of existing enterprises, relocations, and disturbances of the social and economic fabric. Probably the greatest effects would fall on those least able to adjust.

4. Comment Summary: If the proposed cost of the project were invested at $4\frac{1}{2}$ percent, the interest would pay for all flood damages and would have a sum left over greater than the net average annual benefits.

Response: Public Law 566 (Authority for Watershed Projects) does not provide for this type of action. Even if it were possible to invest the money, this alternative does not provide any solution to the flooding problem. By reducing flood damages through channel work and enhancing the landscape through land treatment, the watershed land values will be increased as will the producing capacity of the land thus increasing the nation's gross national product.

RICHARD K. SMITH

1. Comment Summary: Costs should be assigned to destruction of fish and wildlife habitat.

Response: There will be effects to the fish and wildlife resources from the planned project. Efforts to minimize or lessen adverse effects are described on pages 20 and 21. The only means of measuring these costs at the present time is in non-monetary terms.

2. Comment Summary: New formula is proposed to evaluate watershed project.

Response: None.

LIST OF APPENDIXES

Appendix A - Comparison of Benefits and Costs for Structural Measures

Appendix B - Letters of Comment Received on the Draft Environmental Statement

Appendix C - Project Map

Appendix D - Structural Data
Typical Channel Sections

Appendix E - Conservation Land Treatment Measure Description

APPROVED BY

William B. Lingle
William B. Lingle
State Conservationist

DATE

June 24/9

APPENDIX A - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Swan Creek Watershed, Alabama

(Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS ^{1/}					Average Annual Cost ^{3/}	Benefit Cost Ratio
	Damage Reduction	More Intensive Land Use	Changed Land Use	Secondary	Redevelopment	Total	
Channel Improvement	34,783	5,661	2,078	5,560	8,758	56,840	1.4:1
TOTAL	34,783 ^{2/}	5,661	2,078	5,560	8,758	56,840	1.4:1

^{1/} Benefits are based on adjusted normalized prices.

^{2/} In addition, it is estimated that land treatment measures

^{3/} will provide flood damage reduction benefits of \$1,739 annually. Amortized at 4 7/8 percent interest for 100 years.

Date: November 1973

APPENDIX B

"Letters of Comment Received on the Draft Environmental Statement"



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION IV
50 7TH STREET N.E.
ATLANTA, GEORGIA 30323

OFFICE OF THE
REGIONAL DIRECTOR

March 15, 1973

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
P.O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

Re: Draft E.I.S. Swan Creek Watershed,
Limestone County, Alabama

Your letter of January 30, 1973 about the subject watershed has been reviewed as requested by the Washington office of the Department of Health, Education, and Welfare.

Mention is made of a benefit being the reduction of mosquito breeding habitat. It may be well to consider a total insect control program to include mosquitoes. Pages 108-114 of the enclosed "Environmental Health Practice in Recreational Areas" may be helpful in establishing sound vector control measures in this connection.

Very truly yours,

Frank J. Groschelle
Regional Director

Enclosure



United States Department of the Interior

OFFICE OF THE SECRETARY

Southeast Region / 148 Cain St., N.E. / Atlanta, Ga. 30303

March 28, 1973

ER-73/213

Mr. William B. Lingle
State Conservationist
Soil Conservation Service
Post Office Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

This is in response to Acting State Conservationist Dent's January 30 letter to Assistant Secretary-Program Policy requesting our review and comment on the draft environmental statement for Swan Creek Watershed, Limestone County, Alabama. We have reviewed the draft statement for project effects on national park areas, mineral resources, geology, hydrology, and fish and wildlife resources.

We offer the following comments for your consideration:

This proposed project will not adversely affect any existing, proposed, or known potential units of the National Park System, or any known historic, natural, or environmental education sites eligible or considered potentially eligible for the National Landmark Programs.

Although the National Register of Historic Places was consulted and no registry properties are located within the project area, the statement should contain evidence of contact with the Historic Preservation Officer for the State of Alabama (Nilo B. Howard, Jr., Chairman, Alabama Historical Commission, State Department of Archives and History, Montgomery, Alabama 36104; telephone 205/269-7783) and a copy of his comments concerning the effect of the undertaking upon any historical and archeological resources which may be in the process of nomination to the National Register of Historic Places.

It is indicated in the statement that there are no known archeological resources in the project area, but that if any are found during construction, appropriate agencies will be notified so that investigations can take place. We do not concur in this procedure. Environmental assessments should be based on resource knowledge before the fact. It is recommended that an archeological survey of the project site be made to: (1) determine if such values are present and their significance and extent, (2) provide a basis for an adequate evaluation for environmental statement needs, and (3) define any salvage program and cost needed to mitigate losses to the archeological-historical resource base.

It is suggested that the section on present flow conditions of Swan Creek, page 3, paragraph 8, include a stated quantity in million gallons per day for low flow and average flow. We also suggest that under the heading Environmental Impact, page 12, any changes in low flow and average flow which might result after construction of the proposed project be discussed.

We believe the statement should more fully and clearly discuss the significant, direct and secondary, losses of fish and wildlife habitat which will result from the proposed stream excavation. For example, according to the statement, woodland in the flood plain is expected to be reduced from approximately 850 acres (page 2, 32 percent of 2,658 acres) to 478 acres (page 12, 18 percent of 2,658 acres). It is assumed that the 478 figure represents the acreage of woodland which will exist in the flood plain after 222 acres of the 300 acres cleared for construction have been reforested. We believe that the loss of 372 acres or 43 percent of the existing flood plain woodland, which is relatively scarce, represents a significant loss to wildlife habitat.

It is indicated on page 5 that the fishery resources of Swan Creek are generally considered to be of low value. It should also be indicated that physical attributes necessary for the support of significant fishery are present in Swan Creek and the proposed project will have a significant adverse effect on them. Adequate sewage treatment, proper application of fertilizers, pesticides, and other chemicals and land-treatment measures could enhance fishery values.

We believe the alternative section limits its consideration of alternatives to economic values. The basic thrust of the analysis in this section should be to surface the environmental effects

of each proposal. We, therefore, suggest this section be revised to emphasize the environmental effects stemming from the alternatives. In addition, we suggest the section be expanded to discuss the following alternatives, singly and/or in combination:

- . A flood plain levee system.
- . A floodway for that portion of the stream planned for excavation. A floodway was considered only in the Swan Creek Management Area. Clearing and snagging was selected since it would provide the desired level of protection.
- . Selective clearing and snagging instead of stream channel excavation.

Thank you for the opportunity to review and comment on the draft environmental statement.

Sincerely yours,



(Miss) June Whelan
Field Representative to the Secretary
Southeast Region

ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 Peachtree St., N.E., Atlanta, Georgia 30309

MAR 29 1973

Mr. W.B. Lingle, State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

We have reviewed the Draft Environmental Impact Statement for Swan Creek Watershed in Limestone County, Alabama and find that while the project has some features which augment water quality, there are others which detract from present water quality values.

The construction operations in conjunction with the 12.5 miles of channel improvement will undoubtedly cause temporary turbidity and silting in reaches of the stream below the work, and the confinement of flood water in the main channel will increase scouring and silting within the channel. However, this will be offset by improved land use in the upper areas of the watershed and by the fact that flood waters will cause less scouring and erosion of the flat floodplains.

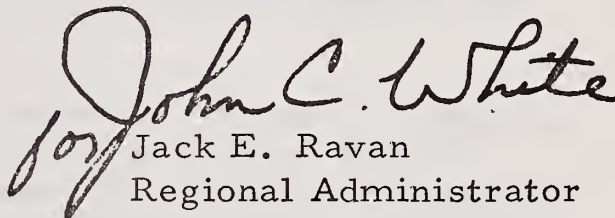
To minimize damage to water quality during construction, it is recommended that final plans and specifications include provisions to protect the quality of area waters from accidental dumping of excavated materials or other wastes into the stream or channel. In particular, construction should be carried out at low flows so as to minimize the consequent increases in turbidity; areas subjected to erosion should be protected with vegetation, riprap or other stable materials as rapidly as possible; and excavated materials should be handled so as to minimize the development of turbid waters.

On Page 3, Paragraph 7, the reader is led to think that Swan Creek is not classified, while actually it is classified for Fish and Wildlife from its source to the Tennessee River.

Also, it should be noted that an effluent of about 2 MGD from the Athens, Alabama sewage treatment plant enters Swan Creek via Town Creek. This facility already provides secondary treatment, yet the Impact Statement reports (on Page 10) that "Stream fishery values are low due to pollution from urban areas." The proposed project would reduce the natural recovery of Swan Creek by changes in temperature and natural reaeration factors, which could then have an adverse effect on the extreme lower reach where the fishery is reported as having value.

We would appreciate five copies of the Final Environmental Impact Statement when it is available, and if we can be of further assistance, please let us know.

Sincerely,

A handwritten signature in dark ink, appearing to read "John C. White" with a large, stylized initial "J" and "W". To the left of the signature, the word "for" is written vertically in a smaller, cursive script.
for Jack E. Ravan
Regional Administrator

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

April 3, 1973

Mr. W. B. Lingle, State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
Post Office Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

In accordance with your request of January 30, 1973, to Mr. Reed A. Elliot, Director, Division of Water Control Planning, TVA has reviewed the draft environmental statement for Swan Creek Watershed, Limestone County, Alabama, and offers the following comments for your consideration.

1. We believe implementation of the measures described on page 11 of the draft statement is important to prevent or lessen possible adverse effects on the Swan Creek Wildlife Management Area. Studies by TVA fisheries biologists confirm that the lower reaches of Swan Creek have a high fisheries value. The shallow waters enhance this value by providing spawning and nursery areas for species such as crappie, largemouth bass, and sunfishes. We believe the present wildlife resources in the management area are also of high value. For example, wood ducks are known to nest in considerable numbers in the riparian forest strip along the present stream channel. If you wish, we would be happy to have the staff of our Division of Forestry, Fisheries, and Wildlife Development to meet with you or to furnish to you the data we have on the area.
2. It is stated on pages 9 and 13 of the draft statement that the average annual suspended sediment concentration in Swan Creek at its mouth is about 600 parts per million. TVA water quality monitoring data resulting from monthly grab samples obtained at five stations in Swan Creek during the period June through November 1967 indicate an average suspended solids concentration of only about 65 ppm. This would correspond to a significantly lower annual disposition of sediment in Wheeler Reservoir than is indicated in the draft statement. Again, if data from our samples would be useful to you, we would be happy to provide it.
3. Data for the Huntsville Standard Metropolitan Statistical Area indicating increasing urbanization of the traditional agricultural land use in Limestone County support the need to encourage

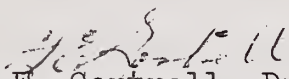
Mr. W. B. Lingle

April 3, 1973

flood plain zoning as mentioned on page 12 of the draft statement. Flood plain zoning outside of the Athens corporate limits should also be considered as a complement to the project.

We hope these comments will be useful to you. Thank you for the opportunity to review the draft environmental statement. Please send us a copy of the final environmental statement when it becomes available.

Sincerely yours,


F. E. Gartrell, Dr. P. H.
Director of Environmental
Planning

THE APPALACHIAN REGIONAL COMMISSION

1605 CONNECTICUT AVENUE

WASHINGTON, D.C. 20235

APR 19 1973

Mr. W. B. Lingle, State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

We have reviewed the draft Environmental Statement pertaining to Swan Creek Watershed, Limestone County, Alabama, and offer the following comments:

1. The Statement places considerable emphasis on land treatment measures. With the current restrictions placed on REAP funds, the largest source of assistance to farmers in the past, and a general reluctance of farmers to apply good conservation practices (especially if costs of farming increase), what is the expectation that benefits resulting from land treatment will occur?

2. On page 17, a reference is made to a 100-year design life for the channel improvements and land treatment. Channel improvements may have a 100-year life, but most land treatment practices are generally substantially less - at least 90 percent less for most. Are recurring costs to maintain land treatment practices made as part of benefit/cost calculations?

3. It is generally realized that land treatment measures have many benefits, both economic and environmental. The Statement repeatedly cites a poor fishery resource in the stream, and explains this as due in part to the level of suspended sediment - especially at the mouth of Swan Creek (p. 13). On page 9, it is stated that only a poor fishery can be expected where suspended solids exceed 400 ppm, and yet the project design anticipates 435 ppm with planned land treatment. To what extent could additional land treatment measures be applied, or selected for application, that would reduce the level of suspended solids to less than 400 ppm to improve the fishery resource to a "good" level, and thereby increase fishery benefits?

4. The Statement repeatedly emphasizes the fact that more intensive use of the flood plain for agricultural purposes will be possible, including row crops, as a result of the project and a concurrent reduction of uses on upland areas - thereby reducing upland erosion. More

Mr. W. B. Lingle

Page Two

APR 19 1973

intensive use of flood plains, especially for crops, would appear to increase erosion potential during floods and during normal periods of rainfall. To what extent is reduction of erosion on the uplands due to land use changes supplanted by erosion of more intensively farmed flood plains?

5. The Statement cites only a 27 percent reduction in sediment as a result of land treatment measures and land use changes. What are alternative courses of action that would further reduce amount of sediment?

We appreciate the opportunity to review your Statement.

Sincerely,



DONALD W. WHITEHEAD
Federal Cochairman



STATE OF ALABAMA
ALABAMA DEVELOPMENT OFFICE

April 12, 1973

R. C. "Red" Bamberg
Director

W. M. "Bill" Rushton
Assistant Director

George C. Wallace
Governor

TO: Mr. William B. Lingle
State Conservationist
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

FROM: Michael R. Amos *MA*
State Clearinghouse
Policy Studies Division

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT

Applicant: Department of Agriculture

Project: Draft Environmental Impact Statement for
Swan Creek Watershed in Limestone County

State Clearinghouse Control Number: ADO-06-73

The Draft Environmental Impact Statement for the above project has been reviewed by the appropriate State agencies in accordance with Office of Management and Budget Circular A-95, Revised.

The comments received from the reviewing agencies are attached.

Please contact us if we may be of further assistance. Correspondence regarding this proposal should refer to the assigned Clearinghouse Number.

Attachments

A-95/05

Agencies contacted for comment:

Top of Alabama Regional Council of Governments
Department of Conservation and Natural Resources
Soil and Water Conservation
Bureau of Environmental Health
Alabama Development Office-Hyde

TO: Mr. Wilbur B. Nolen, Jr.
Soil and Water
Conservation

CH Number

ADO-06-73

Applicant

Department of Agriculture

Program

Draft Environmental Impact State
ment: Swan Creek Watershed in
Limestone County

DATE: February 12, 1973

Return Prior to:

As soon as possible
Date

Please review the attached environmental impact statement and indicate your comment with respect to any environmental impact involved.

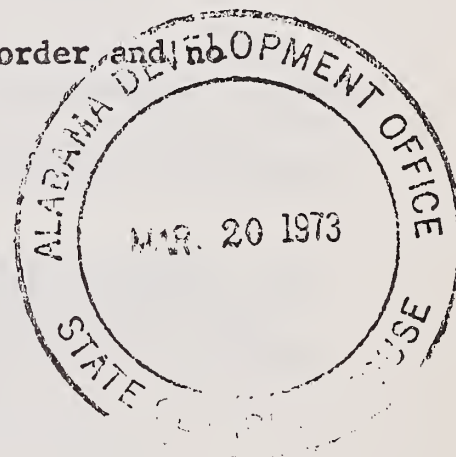
Comments: (Please check one block.)

☐ No comment (Environmental impact statement is in order and no additional comments are offered.)

☒ Comments (Elaborate below.)

Comment here:

(SEE ATTACHED)



The proposed Swan Creek Watershed project in Limestone County, Alabama, was approved for planning, under Public Law 566, by the State Soil and Water Conservation Committee on November 19, 1959. Public Law 566 is generally known as the "Small Watershed and Flood Prevention Act."

Numerous small watershed developments have been initiated by local sponsors and subsequently completed throughout the State of Alabama. All of these projects, originated by local people and implemented with technical assistance from the Soil Conservation Service, U. S. Department of Agriculture, were conceived for the sole purpose of environmental enhancement. In the Swan Creek proposal such environmental improvement will result because of a substantial reduction in flood damages coupled with the natural resource enhancement and preservation aspects.

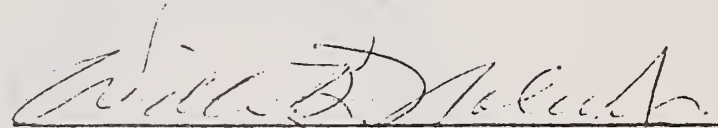
Small Watershed projects like this are extremely popular in Alabama and have been very beneficial to many communities in various ways.

Some are essentially for flood control purposes in order to protect lives, property and wildlife habitat. These also may materially reduce the pollution and sedimentation of natural streams in the watershed involved.

Other small watershed developments are multi-purpose in nature. Flood control, municipal and/or industrial water supply, recreational values and aesthetic benefits are included in projects of this type.

In essence, these small watershed projects are designed to help solve the broad spectrum of both human and natural resource problems in Alabama. Not the least of benefits which may be attained by their implementation is economic--a better life to go with an improved and safer environment for all Alabama citizens.

The State Soil and Water Conservation Committee strongly supports the proposed Swan Creek plan and is of the collective judgment that this small watershed development would be highly beneficial, to the project area when it is completed.


WILBUR B. NOLEN, JR., EXECUTIVE SECRETARY
STATE SOIL & WATER CONSERVATION COMMITTEE

REQUEST FOR REVIEW OF ENVIRONMENTAL IMPACT STATEMENT

TO: Mr. Reynolds Thrasher
Conservation and Natural
Resources

CH Number

ADO-06-73

Applicant

Department of Agriculture

Program

Draft Environmental Impact State-
ment: Swan Creek Watershed in
Limestone County

DATE: February 12, 1973

Return Prior to:

As soon as possible
Date

Please review the attached environmental impact statement and indicate your comment with respect to any environmental impact involved.

Comments: (Please check one block.)

- ☐ No comment (Environmental impact statement is in order and no additional comments are offered.)
- ☐ Comments (Elaborate below.)

Comment here:

See attached



RW Thrasher

Signature

Please Return Original to:

Alabama Development Office
Office of State Planning
State Clearinghouse
State Office Building
Montgomery, Alabama 36104

FORM CH-2a
8/71

STATE OF ALABAMA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

64 North Union Street - Montgomery, Alabama 36104

GEORGE C. WALLACE
GOVERNOR
CLAUDE D. KELLEY
COMMISSIONER
SIDNEY D. BLEDSOE
ASSISTANT COMMISSIONER

February 27, 1973

DIVISION OF GAME and FISH
CHARLES D. KELLEY, DIRECTOR

MEMORANDUM

TO: Mr. Reynolds W. Thrasher, Chief
Outdoor Recreation Section

FROM: Ralph H. Allen, Jr., Chief *Ralph H. Allen Jr*
Game Management Section

SUBJECT: Comments on Draft Environmental Impact Statement on
Swan Creek Watershed in Limestone County

The Game and Fish Division offers the following comments on the Swan Creek Draft Environmental Impact Statement.

1. Figures included in the Draft Environmental Impact Statement on flood damage, etc., are entirely different than those in the work plan for the Swan Creek Watershed. Data within the Environmental Statement should agree with the data within the work plan.
2. Limestone County ranks No. 67 in the acres of woodlands of counties in Alabama. The loss of 372 acres of woodlands to the project, as proposed, will have an adverse effect on certain species of wildlife within the watershed. Likewise, the manipulation of stand composition of approximately 2,500 acres of hardwoods and hardwood pine stands in order to develop pure pine stands will adversely effect wildlife.
3. The conversion of 372 acres of woodlands to row crops, pastures and other miscellaneous agricultural uses in addition to the 12 plus miles of ditch digging and spoil dumped on the stream bank will increase rather than decrease sediment reaching the Wheeler Reservoir.

MEMORANDUM

Mr. Reynolds W. Thrasher

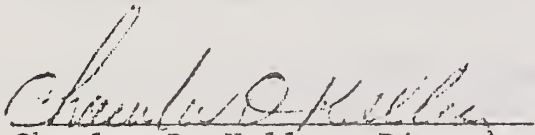
February 27, 1973

Page 2

4. Nothing in the Environmental Statement or the work plan indicate that the Soil Conservation Service investigated the possibility of using less destructive construction techniques than stream channelization as directed by SCS Watershed Guideline Memorandum 108. It also appears that Section 2 of the 108 Guideline Memorandum which states "channel improvement is supplementary to flood control retardation, not an alternative for achieving an adequate level of flood protection" was circumvented.

RHA:rlc

APPROVED:


Charles D. Kelley, Director
Game and Fish Division

FEB 15 1973

REQUEST FOR REVIEW OF ENVIRONMENTAL IMPACT STATEMENT

ENVIRONMENTAL HEALTH
ADMINISTRATION

TO: Mr. W. T. Willis
Environmental Health
Administration

CH Number

ADO-06-73

Applicant

Department of Agriculture

Program

Draft Environmental Impact State-
ment: Swan Creek Watershed in
Limestone County

DATE: February 12, 1973

Return Prior to: As soon as possible
Date

Please review the attached environmental impact statement and indicate your comment with respect to any environmental impact involved.

Comments: (Please check one block.)

☐ No comment (Environmental impact statement is in order and no additional comments are offered.)

☒ Comments (Elaborate below.)

Comment here:

see attached sheet

W. T. Willis

Signature

Please Return Original to:

Alabama Development Office
Office of State Planning
State Clearinghouse
State Office Building
Montgomery, Alabama 36104

FORM CH-2a
8/71

STATE OF ALABAMA
WATER IMPROVEMENT COMMISSION

IRA L. MYERS, M. D.
CHAIRMAN
- STATE HEALTH OFFICER

CLAUDE D. KELLEY
VICE CHAIRMAN
COMMISSIONER, DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES

JAMES W. WARR
ACTING CHIEF ADMINISTRATIVE OFFICER
MONTGOMERY, ALABAMA 36104

749 STATE OFFICE BUILDING

TELEPHONE 269-7971

April 6, 1973

M E M O R A N D U M

TO: Mr. W. T. Willis, Director
Bureau of Environmental Health

FROM: E. John Williford, Jr. *EJW*
Water Pollution Control Biologist

RE: Draft Environmental Impact Statement:
Swan Creek Watershed in Limestone County

After reviewing the environmental impact statement the following comments are offered:

The statement of Page 5 referring to "Wildlife resources are low to moderate in number" may be true when compared to other sections of the United States, but as compared to Alabama, it contains one of the better waterfowl wintering areas, and our best goose wintering area.

The report appears to be lacking in information relating to increased nutrient flow into the lower reaches of the creek and into the Wheeler Reservoir on the Tennessee River.

Statements on Pages 14 and 15 refer to a slight increase in temperature because of a lack of stream canopy. It would appear that some statement would be needed as to the affects of the increased temperature, if any, on aquatic life.

Siltation reduction within the stream is based on stream bank stabilization; however, if the project area is maintained, the stabilization of the banks will be short-lived. If the banks are not maintained, the stream will revert back to its natural state and the original stabilization project will have been in vain.

COMMISSION MEMBERS

MARVIN O. BERGLIN

DR. ROBERT M. BUCHER

LOUIS GRABENSTEDER

HENRY A. LESLIE

ROBERT T. WRIGHT

ALABAMA WILDLIFE FEDERATION

660 ADAMS AVENUE - MONTGOMERY, ALABAMA 36104

(205) 263-6565

ALABAMA
WILDLIFE
FEDERATION

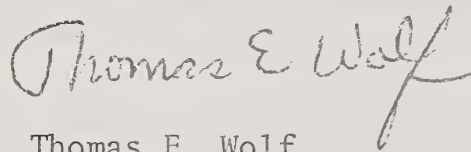
26 March 1973

Mr. W. B. Lingle
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

Enclosed are comments which we request be included in the final
Environmental impact statement for the Swan Creek Watershed,
Limestone County, Alabama.

Sincerely,



Thomas E. Wolf
Director - AWF

CC: Mr. Reo Kirkland
Council on Environmental Quality

TEW/bew

AFFILIATED WITH
NATIONAL WILDLIFE FEDERATION

HOYT KIRK
PRESIDENT
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RAY REDMOND
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SECRETARY - TREASURE
REO KIRKLAND
EXECUTIVE SECRETARY

1. The Swan Creek Watershed Work Plan published in August 1968 was developed on 1966 prices and amortized at 3 1/4%. The Environmental Impact Statement was published in January 1973 using entirely new figures without explanation on what year prices such figures were based. No mention is made to indicate the amortization rate has been increased to present standards.

The 1968 Work Plan should be updated to correspond with statements, figures, etc., used in Environmental Impact Statements or the Environmental Impact Statement should be based on the figures and data within the work plan.

It is inconceivable that an Environmental Impact Statement can be accepted when the Environmental Statement is not based on facts and figures included within the project work plan.

For example, on page 6 of the work plan, average annual flood damages are listed as one figure (1), as another figure on page 21 of the same work plan (2), and as still an entirely different figure within the environmental statement, page 9 (3).

	(1)	(2)	(3)
Crops and Pastures	\$17,874.00	\$24,464.00	\$30,135.00
Other Agricultural	\$ 9,325.00	\$14,950.00	\$14,950.00
Roads and Bridges	\$ 490.00	\$ 490.00	\$ 490.00
Indirect	\$ 2,821.00	\$ 4,042.00	\$ 4,383.00
TOTALS	\$30,510.00	\$43,946.00	\$49,958.00

Which of the above flood damage figures are we supposed to accept as the correct figures?

If the figures listed in the Environmental Impact Statement are correct on acres in crops and pastures, woodlands, etc., and if the figures on the average production of 1.5 bales of cotton, 60 bushels of corn, 35 bushels of soybeans, 2650 board feet of saw timber and other farm incomes from pastures and miscellaneous land used in the watershed are correct, how is it possible that the income for landowners within the Swan Creek Watershed is not greater than the average farm income of \$5,000.00 per family for Limestone County? Of course, no mention is made of the farm income of landowners in the Swan Creek Watershed, but insinuations used were designed to lead one to believe that the income is less than the average for the county.

Contrary to the statements used both in the Environmental Impact Statements and in the Work Plan, much of the benefits claimed will result from converting 372 acres of the woodlands within the flood plains (44%) into crop and pasture lands. This 372 acres of woodlands will be converted to 52 acres of additional crops, 160 additional acres of pastures, and 170 additional acres of miscellaneous agricultural uses. It is recommended the Impact Statement include data on number of acres in the watershed on which the U. S. Government is paying under ASC for not planting crops.

Limestone County already ranks 67th in acres of woodlands (some 42,000 acres less than any other county). The loss of 372 acres of flood plain hardwoods would be a serious environmental loss to this county.

On page 13 (third complete paragraph of Environmental Statement) the SCS claims that land use changes and land treatment measures will reduce sediment into Wheeler Lake by 30,250 tons annually. This cannot be true. More erosion will occur when 372 acres of woodlands are cut and converted to row crops and other agricultural uses. With the many thousands of tons of sediment that will result from the digging out and widening of Swan Creek and the placing of spoil along the stream bank and with the removal of 372 acres of woodlands there can only be an increase of sediment reaching Wheeler Lake, not a drastic reduction as claimed.

On the other hand, the instillation of land treatment measures without destroying 372 acres of woodlands and without digging out the Swan Creek channel would possibly result in a decrease in sediment loads reaching Wheeler Lake.

The manipulation of stand composition of approximately 2500 acres of forest lands in order to convert hardwood and pine hardwood stands to pure pine stands will result in a serious adverse effect on wildlife and other environmental assets within the watershed.

The termination of the Swan Creek channel at the L&N Railroad bridge will cause a serious bottleneck and result in more and larger floods along the lower reaches of Swan Creek. On a similar situation on Nance Creek in Lawrence County, the termination of channelization created a similar "bottleneck" and resulted in floods of greater depth and severe siltation upstream from the bottleneck than had occurred previously.

Fish and wildlife losses from direct channelization and the removal of quality stream bank wildlife habitat will be just as real as the losses from floods and should, therefore, be included as a cost of the project. No true benefit-cost ratio can be claimed unless fish, wildlife and other environmental losses are included.

Nothing in the environmental statement indicates that the least destructive construction techniques are to be used even though it may increase the cost as set out in SCS Watershed Guideline Memorandum 108. These techniques include minimum clearing, selected snagging, and clearing upstream from the L&N Railroad, flood water impoundment, floodways, limiting excavation and spoil deposits to one bank, temporary sediment basis, plant material selected for their ability to control erosion for food and cover for wildlife or for beauty and ease of maintenance. These measures are not even discussed as alternates and no reason is given why they were not selected in lieu of direct channelization.

Swan Creek appears to be an ideal stream on which suction pumps could be used to remove sand and gravel and bring the stream back into its original channel confines and provide as effective flood control, or an even more effective flood control, than will the 12 plus miles of channel excavation with its undesirable environmental damage. There is no indication that studies to determine the feasibility of the suction pump technique has been investigated.

It also appears that Section 2 of the SCS Watershed Guideline Memorandum 108 is being circumvented on the Swan Creek Watershed project. Section 2 of this directive says "channel improvement is supplementary to flood control retardation, not an alternative for achieving an adequate level of flood protection. Channel improvement should be considered only after it has been demonstrated that land treatment measures and all feasible watershed structures will not provide an adequate level of flood protection."

There are flood water impoundment reservoir sites available along the upper reaches of Swan Creek, but to construct them would have required the relocation of a railroad or a highway and because the relocation cost of these man-made structures would have to be borne by the sponsors, these structure sites were declared not to be feasible. This action is clearly in violation of the SCS's own guidelines.

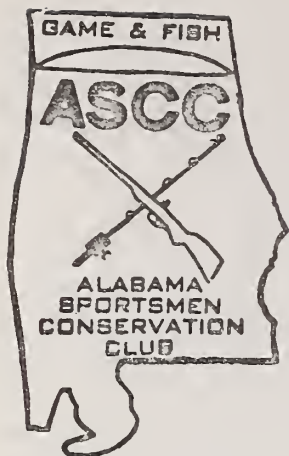
Why are SCS personnel able to decide if the cost of relocating a railroad or a highway is a greater long-range expense than is the loss of fish, wildlife and other environmental resources that will be lost as a result of the additional stream channelization that is required to give the same degree of flood protection as would be provided by flood water impoundment reservoirs?

No mention is made of the effect on the woodduck population which is known to nest on woodland adjacent to Swan Creek. In a five-year study of the Woodduck population on Crow Creek in Jackson County, the Department of Conservation and Natural Resources found that channelization reduced the nesting population drastically. Further discussion should be made to justify the statement on Page 6 of the Environmental Statement that channel modification will have no adverse effect on the Tuscumbia Darter.

No consideration is given to including the Swan Creek Watershed in the Water Bank Act. Statement should be revised to show why none of the watershed area was implemented under Public Law 91-559.

The statement is made on Page 7 of the Environmental Statement that "There are no known archaeological or scientific sites of value within the watershed." It is suggested that the statement be revised to include comments from the University of Alabama, Museum of Natural History.

It is recommended that consideration be given to the possibility of increased floods and damages downstream. Similar channelization projects in Minnesota have been cited as having resulted in severe downstream flooding.



ALABAMA SPORTSMEN CONSERVATION CLUB

AFFILIATED WITH
ALABAMA WILDLIFE FEDERATION

P. O. BOX 3219
HUNTSVILLE, ALABAMA 35810

April 26, 1973

JAMES B. HUBBARD
President

3019 BAYLESS DR., S.W.
HUNTSVILLE, ALA. 35805

CARL L. WILLIAMS
Vice President

510 REDBUD DR., S.W.
HUNTSVILLE, ALA. 35805

HOWARD F. GRIFFIN
Secretary-Treasurer

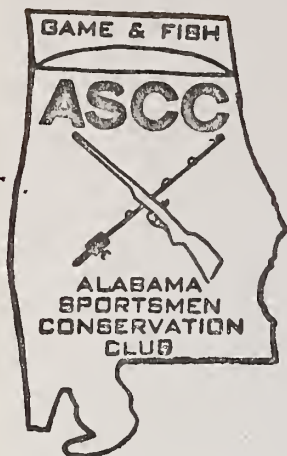
1312 LOCUST AVE., S.E.
HUNTSVILLE, ALA. 35801

Soil Conservation Service
P. O. Box 311
Auburn, Alabama

Dear Mr. Lingle:

After studying the environmental impact statement on the proposed Swan Creek Watershed Project we wish to take issue with the justification of the project and of the project itself. If time and money permitted we could prepare a more lengthy and much more impressive paper than the Soil Conservation Service stating our opposing view. However, since this is only our Earth and not our jobs, we are limited by our facilities to stating a few of our objections. We hope these objections along with others that are certain to be forwarded will be sufficient to cause further study into the project before any destruction begins:

1. It is stated that the watershed needs better fish and game management, however the Alabama Department of Conservation was not asked for a reply to the statement.
2. It is stated that the watershed needs better forestry management, however the Division of Forestry was not asked for a reply to the statement.
3. In the interest of true conservation it is inconceivable to pay a landowner for an easement on the spoils area, and then only allow reforestation at the landowner's option.
4. The text states "It is estimated..." several times. Who made these estimates? What was the basis of their estimates?
5. The amount of silt entering the Tennessee River is a very important factor in the delicate ecological balance. This balance appears to be correct at the present since there is sufficient vegetation to support a healthy fish population but not so much vegetation



ALABAMA SPORTSMEN CONSERVATION CLUB

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(2)

that it smothers out fish and makes navigation impossible.

JAMES B. HUBBARD
President
3019 BAYLESS DR., S.W.
HUNTSVILLE, ALA. 35805

CARL L. WILLIAMS
Vice President
510 REDBUD DR., S.W.
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HOWARD F. GRIFFIN
Secretary-Treasurer
1312 LOCUST AVE., S.E.
HUNTSVILLE, ALA. 35801

6. We feel the Cost/Benefit Ratio is grossly exaggerated to provide justification rather than present all the facts (ie. the 25 man/year employment mentioned would be insignificant to the area; constant maintenance dredging would be necessary to maintain the proposed channel; the present land value, wildlife value, and recreational value would be greatly enhanced by proper sewage treatment facilities in the city of Athens, for which plans have already been made).

In summary, it is our position that much greater environmental and economic benefits, and a much greater Cost/Benefit Ratio would be realized by blocking all proposed channel work on the Swan Creek Watershed and transferring all money from this project to the project for installing a sewage treatment plant in the city of Athens.

Sincerely,

James B. Wilbourn
for ASCC

cc: Alabama Wildlife Federation
Council on Environmental Quality
Governor George C. Wallace



Incorporated 1969

The Alabama Conservancy

1816-E 28th Avenue South
Birmingham, Alabama 35209
March 29, 1973

Mr. W.B. Lingle
State Conservationist
P.O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

Please find enclosed the comments submitted by the Alabama Conservancy on the draft environmental statement for the Swan Creek Watershed, Limestone County, Alabama. We request that these comments be attached to the final environmental statement, as indicated in your letter of February 2, 1973.

I do hope that our comment will receive serious consideration in the reevaluation the Soil Conservation Service makes on this proposed project.

Thank you very much.

Sincerely,

Louise G. Smith

Mrs. Lindsay C. Smith
President

WS/ah
enc.

COMMENTS ON THE DRAFT ENVIRONMENTAL
STATEMENT, SWAN CREEK WATERSHED
LIMESTONE COUNTY, ALABAMA

Totally, the Draft Environmental Statement on the Swan Creek Watershed is completely inadequate. There are several major reasons for this:

1. Many of the statements made are unsupported by any evidence and are obviously erroneous conjecture.
2. Certain of the statements are contrary to published scientific facts or have been made in the absence of even the most rudimentary scientific reasoning.
3. The Statement is grossly incomplete in the factors it considers.

Downstream Sediment Delivery

The effects of downstream sedimentation are ignored or inaccurately portrayed in the Statement.

On p. 13 it is stated that land treatment measures and land use changes will result in a 27 percent reduction in total erosion from the watershed. In the next paragraph it is stated that there will also be a 27 percent reduction in sedimentation. The Statement obviously is equating erosion with sedimentation. The terms and the phenomena are basically different, however. Erosion refers to the removal of material from the land surface. Sedimentation refers to the carrying and deposition of eroded material. The fact that the SCS personnel writing this Statement do not understand such a basic difference is disturbing.

Nowhere in the Statement is mention made of the drastic increase in sedimentation which will result from baring the soil by channel construction and from cleared land adjacent to the channel. The so-called "appropriate vegetation" which will purportedly minimize erosion is not stated as to type. Actually, no type of vegetation except the root armor

provided by bottomland trees can stabilize the bank. The Statement says that trees will be planted on the spoil area "where agreed to by landowners." This is exceptionally vague and may mean that no trees at all will be planted. Even if trees were planted along the spoil bank throughout, it would be 15-20 years before they would reach a size sufficient to make them effective in retarding bank erosion and slumping.

Although the planned excavating in reaches may retard downstream sedimentation for a time, when the unexcavated areas are channeled, sediment will move downstream unchecked.

No data is provided to indicate the number or size of the sediment traps or their sites. No indication is given as to how often they will be cleaned during construction. Most seriously, there is no indication that they will ever be cleaned after construction. They will in fact undoubtedly fill with sediment during the first year and be entirely functionless during the entire remainder of the project life.

The Statement (p. 11) is exceptionally naive in assuming that pools below grade will fill with sediment and function as sediment traps while pools behind rock areas above grade will remain sediment free and restore "natural (?) fish habitat." Obviously, if one type of pool is going to fill with sediment, the others will also become filled. This part of the Statement was clearly written by someone who lacked knowledge of even the most rudimentary principles of erosion, sedimentation, and hydrology.

The statement (p. 11) that "where practical" excavation will only be done from one side, is vague and valueless. Who will decide what is practical, the drag-line and dozer operators? Will this decision be left to the landowners? Who will provide the expertise necessary? Perhaps, in the end, it will turn out that someone decides that there are no areas where it is practical to excavate from only one side.

When totally considered, it is obvious that the channel, unprotected by root armor, will badly erode and increase sedimentation to a far greater extent than the land treatment measures will decrease it. Since there is no guarantee that the landowners will fulfill the land treatment agreements (since they have not done so in a number of other comparable projects), the danger of siltation is even greater.

Effects of Downstream Sedimentation and Rapid Runoff

Increased sediment derived from the channel will increase the sedimentation and turbidity in Wheeler Reservoir.

Sediment-attached nutrients will contribute to eutrophication and aggravate the aquatic weed problems already present in the TVA reservoirs.

Since Swan Creek receives the effluent from the Athens sewage treatment plant, the downstream problems of too much nutrient enrichment will be further aggravated. The detoxification and pollutant-absorbing capabilities of natural streams are well known. Channelized streams lack these features. In this project, after construction, the pollutants from Athens and other damaging elements such as pesticides and fertilizers will be flushed downstream more rapidly and in higher concentrations. Nowhere in the Environmental Statement is this likelihood mentioned or considered. Nowhere are the eventual possible effects of this situation mentioned.

The possible increase in turbidity from increased sedimentation is not mentioned in the Statement, except as it relates to the construction phase.

Rushing the water down the artificial channel will increase problems of flooding in the mouth of the creek and in the impounded Tennessee River.

Damage to the Forest Resources

The Statement admits that approximately 300 acres of forest land will be cleared for project installation. Supposedly, 222 acres will be reforested after clearing. No mention is made of how this reforestation will be accomplished, what tree species are being removed, or what species will be restocked. Hardwoods are already in very short supply in the Southeast. This project will reduce their acreage further. The drainage of stream edge and bottomland areas will change the character of the sites so that the original forest type cannot be replaced by succession.

The contention that 222 acres will be reforested cannot be supported on the basis of other evidence in the Statement, since on p. 11 it indicates that trees will be planted along the spoil bank only where "approved by landowners."

Also, since the planned land treatment measures on forest land will be up to the landowners, most of them will not be done. Some of the so-called "land treatment measures" will actually function to increase soil erosion. On p. 10, "forest improvement cutting" is listed as a land treatment measure. Actually, the idea that cutting trees is a type of beneficial land treatment is absurd. Wherever this activity occurs, the disturbance of the soil that will accompany it will increase erosion.

Wildlife Resources

The overall effect of the project will obviously be the degradation of wildlife resources both in and downstream from the project area.

First, the increased sediment in the water, the increased temperature, the lack of bank cover, and the destruction of stream organisms that are potential food will lower the capability of the stream to provide water and food for the furbearers especially, and other types of wildlife in general.

The so-called "forest improvement cutting," if done, will probably cause the removal of den trees, mast trees, and potential den trees.

The clearing and snagging within the Swan Creek Wildlife management area will reduce the available substrates on which food organisms develop. This will damage wildlife populations which depend entirely or in part on the stream for food.

There is no way to assess, from the Statement, the effect of pond construction on wildlife because the number, size, type, and location of the ponds is not mentioned anywhere in the Statement. The failure to disclose or obtain this information is a serious omission.

On p. 14, the reduction of floods is used to claim increased benefits to certain birds. Nowhere are any of the damages mentioned to birds that feed in flooded areas or need wetland type habitats.

Fish Resources

The increased turbidity, increased sedimentation, increased water temperature, and flushing of increased nutrients and pollutants downstream will have a serious effect on the fishes inhabiting Swan Creek and the adjacent portions of Wheeler Reservoir. The construction of ponds as mitigation for these damages is ridiculous since there are already 35 fish ponds within the watershed. The replacement of a potential stream fishery with additional ponds is illogical because it entails the destruction of a dwindling resource and the supplementation of a resource already in overabundance. The Statement does not disclose whether or not the additional ponds being built with public assistance will be open to the public. If they are not, then obviously public funds are being used to build private lakes. We feel sure that the Soil Conservation

Service, in its agreements with the project sponsors, will insist that all ponds and other potential recreational areas, constructed or created entirely or partially with public funds, will be made available for public use.

It is contended that construction of the channel with a deepened centerline (p. 11) will maintain a uniform flow for fish passage during dry periods. However, the abundance of sediment during and after construction will probably fill this deepened area immediately. The pools supposedly created by leaving rocks above grade will also fill with sediment and will not provide habitat. In any event, the contention that these pools, in an artificial channel will provide "natural" fish habitat is biologically naive.

The clearing and snagging in the lower reaches of the creek will remove cover for fishes and reduce the substrate for the development of food organisms. This area is cited (p. 11) as being the area which currently "supports most of the stream fishery resource." Clearing and snagging will contribute to its destruction.

Damage to Rare and Endangered Species

Material on p. 6 mentions several rare species which may be found in the watershed. The list is incomplete, even if only the recent publication by the Alabama Department of Conservation is consulted. Among the fishes, Notropis boops (rare--2) has been omitted. There is a considerable possibility that this species occurs in Swan Creek.

No mention is made of any rare or endangered species of invertebrates, especially snails and naiads. Seemingly no attempt was made to investigate the possibilities of damage to these forms.

Archaeological and Historical Values

On p. 7 it is stated that if "any archaeological, scientific, or historical materials" are found during construction, appropriate officials will be notified. The question arises as to the qualifications of construction workers to evaluate or even notice potentially significant materials. Obviously there will be no one with expertise in these areas present during construction and valuable materials, if present, will probably be destroyed.

Alternatives

This section of the Statement is exceptionally weak. Many possible alternatives were not explored.

The contention that there are no possible sites for floodwater retarding structures is not supported in the Statement. On p. 7 it is indicated that there are three potential sites for recreational water storage in the Swan Creek stream system. Could these not also be used to control floodwaters? In the past, the Soil Conservation Service has repeatedly contended that ponds created for floodwater retarding could also be used for recreation. What would the effects be if these three sites were used in combination with land treatment?

The possibility of combining land treatment measures with purchase of low-lying portions of the floodplain, which flood most frequently, was not considered.

The possibility of using some of the funds to construct better flood-resistant bridges was not considered. This method would eliminate damage to bridges and would be much less costly. The Statement did not disclose how much of the damage to bridges and flooding results from improper bridge and roadfill construction.

The Statement does not disclose the effects of purchase of all-risk crop insurance by the sponsors. Nor was this possibility considered in combination with other measures. Such insurance is presently available through the Federal Crop Insurance Corporation and may be available to the project sponsors.

The Statement does not disclose the effect of clearing and snagging throughout the watershed and deletion of channelization. This method could be combined with others.

A workable program might be a combination of land treatment, with bridge and roadfill improvement, with some snagging, with some floodplain zoning, with some land purchase, with some crop insurance.

We do not necessarily endorse any of these alternatives but failure to consider them is clearly a violation of NEPA.

Cumulative and Long-term Effects

In view of the obvious failure of the TVA dam system to function properly during the recent floods, the contentions on the bottom of p. 17 are meaningless. This project, in

combination with others existing planned or anticipated will flush additional waters into the Tennessee River and aggravate the flooding that is already too much for TVA measures to handle.

This project in combination with others will flush sediment-fixed nutrients, fertilizers (on p. 8, increased fertilizer use is anticipated) and pesticides into the pooled areas of the Tennessee River. Turbidity will be increased. Aquatic weed problems will be aggravated. Eutrophication and destruction of the aquatic resources of the Tennessee River will result.

Taken together these projects will critically damage the hardwood resources, fisheries resources, and recreational resources of the Tennessee Valley in a major way.

Comments on the List of Favorable Effects

Point b is untrue since it has been repeatedly shown that channelization increases erosion and sedimentation.

Point d is untrue since it has been proven that channelization increases high flows and decreases low flows.

Point e is untrue since small pools in the artificial channel will provide myriads of mosquito breeding sites during low flow times. Predators to reduce mosquito larva populations will be lacking.

Point f is untrue since there will be an increase in sediment, turbidity, and pollutant runoff.

Point g is untrue especially concerning the bottomland species which must have wet soils and flooding to survive.

Points h and i can be accomplished without the project, and point i is unnecessary.

Point j is childishy absurd since it entails drying up a wetland and destroying the habitats of wetland species to increase the habitat for animals already in abundance in the upland portions of the watershed.

Points k, l, and m could be accomplished without the project.

Comments on the List of Adverse Effects

In addition to the multitude of adverse effects previously mentioned in these comments the following should be considered.

1. Destruction of the potential of Swan Creek as a natural laboratory and recreational area for students at Athens College, high school students, and citizens of the area.
2. Possible damage to the ground water level.
3. Ultimate degeneration of the fertility of the bottomland soils in the area where flooding is reduced. No mention is made in the Statement of the properties of the carried sediments as they relate to soil fertility. Increased needs for fertilizers after soil degeneration begins will aggravate previously mentioned problems.

Other Considerations

The Statement does not disclose the basic contradictions in U.S. Government policy involved in this project. First, tax money will be used to enable greater crop production in the Swan Creek Watershed. The Statement does not mention how many of the landowners are now receiving payments from ASCS to keep land out of production and decrease crop production. The Statement does not disclose the relationship between current price supports and increased production. The Statement does not disclose the significance of increased production here when a third of the nation's cropland lies idle.

The monetary data are not complete enough to enable project evaluation. Included should be the average dollar benefit per year, per landowner. This information, had it been included could be used to determine the benefits per year to the small landowners who really need it. If most of the benefits accrue to the large landowners who are already wealthy, then the project is obviously foolhardy.

Summary

The Swan Creek Watershed Draft Environmental Statement is inadequate in almost every respect. It is contrived, incomplete, and inaccurate and amounts to little more than a feeble attempt at project justification.

The fact that there is no way to guarantee sponsor cooperation in land treatment means that there is no method of assuring the public that these measures will be carried out.

Vague statements such as "Farmers . . . will be urged . . . to utilize good conservation management practices" are meaningless. The phrases "where practical" and "where approved by landowners" provide no useful information.

So many statements are made contrary to or in the absence of scientific evidence. No studies are cited to show the extent of recent sediment deposition in the channel. How was this information obtained? Were core samples taken? How were they dated?

In many cases only the changes are mentioned without considering the impact of the changes. On p. 15, a slight increase in stream temperature is mentioned. The impact of this change as it relates to tolerances of stream organisms, oxygen-carrying capabilities of the water, rate of decomposition, and other factors was not even mentioned.

NEPA requires full disclosure of the environmental impact of a project. NEPA guidelines use the phrase "assess in detail." This amateurish Statement is contrary to law and needs to be completely done over from start to finish.

Submitted by:

The Alabama Conservancy
Mrs. Lindsay C. Smith, Pres.

The Alabama Conservancy

Huntsville Chapter

P. O. Box 1473

Huntsville, Alabama 35807

March 26, 1973

Mr. William B. Lingle
Soil Conservation Service
P.O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

Our chapter appreciated the opportunity to comment on the Draft Environmental Impact Statement for Swan Creek Watershed. Please find enclosed our comments which were unanimously adopted by the Executive Committee on March 22, 1973.

Sincerely yours,

G. P. Roys

G. P. Roys
President

Enc.

Swan Creek Watershed
Draft Environmental Statement
comments by
Huntsville Chapter of The Alabama Conservancy
March 22, 1973

The draft statement covers a number of topics, however most of these seem to be concerned with project justification rather than environmental impact. While the statement does discuss some adverse environmental effects in a cursory manner, full disclosure is only given of the claimed economic and agricultural benefits.

Specific comments are:

A notable exclusion to the list of Federal, State, and Local Agencies from which written comments have been requested is the Alabama Department of Conservation and Natural Resources.

Lack of local support for the project and the land treatment measures in particular is evident in that only 52% of the watershed, less urban areas, is covered by conservation agreements with the Limestone County Soil and Water Conservation District and that only 37% of the landowners in the watershed are district cooperators.

The economic benefits to the watershed farmer are discussed and the proportion of low incomes for Limestone County farmers is also presented. However, the application of county-wide statistics to a particular area is of questionable validity in establishing the desirability of the project benefits.

Additional benefits for the project are given by projecting population growth and the associated development of the area. Development which may or may not occur if the project is completed should not be considered as a benefit of the project. This type of reasoning is labeled "circular logic" and has been legally rejected.

Road and bridge damages attributed to flooding contributed \$490 annually to total flood damage costs; however, indirect costs, as exemplified by "rerouting traffic to avoid a washed out bridge or culvert", are accrued at a rate of \$4,383 annually. It is not sufficiently explained how indirect flood damage can be approximately tenfold that of direct flood damage.

The evaluation of fish and wildlife resources is generally inadequate. The use of information from Swan Creek and Mallard-Fox Creek Wildlife Management Areas to evaluate the hunting and trapping resource for the whole watershed is questionable. The enumeration of fish species affected by the project is incomplete. The fishery value of the stream is rated as being of low value. This current low value is a reflection of pollution from the City of Athens and agricultural practices, not the physical attributes of the stream.

The conclusion that "as presently planned, channel modifications should have no adverse effects" on the vertebrates classed Rare-1 and Rare-2 is totally unsubstantiated.

The inclusion of increased farm pond fishery creation of employment, improvement of local economy, and improvement of transportation systems under favorable environmental effects is questionable.

Under adverse environmental effects the increase in stream temperature is indicated as being slight. This is an understatement. Also, the loss of streambank wildlife food and cover by construction will last considerably longer than the construction period.

The alternative of using floodwater retarding structures was eliminated because no physical sites were available. This is in contradiction with the project work plan which indicated that two sites were studied and one was even investigated and found to be geologically acceptable. The work plan indicated this alternative was dropped because of economic considerations.

Other alternatives which should have been investigated are: selective clearing and snagging instead of channelization, a flood plain levee system, and the use of floodways for portions of the stream.

The lack of consideration given alternatives to channelization is best evidenced by looking at the flood plain purchase alternative. The cost of

purchase is calculated using the whole 100 year flood boundary. Hence, nearly a 100% flood damage reduction would occur. To make a realistic comparison, this alternative cost should be lowered by only purchasing the needed land to effect a 70% reduction in flood damages. Also, the loss of tax revenue from the flood plain would probably be offset in part by contributions in lieu of taxes that a managing agency would make.

The discussion of irreversible and irretrievable commitments of resources is totally inadequate. It only considers the loss of 79 acres because of increased channel size when in reality this project will result in the destruction of 12 miles of stream.

No consideration is given the loss of the beneficial effects of the flooding such as flood plain soil enrichment.

No mention is made of the loss in scenic value to persons living near the stream, particularly in Athens.

The increases in benefits claimed between the 1968 work plan and the current draft impact statement are very large. Total benefits increased 42%, while those from damage reduction increased 20%, secondary benefits increased 7 3/4%, and redevelopment benefits increased 45%.

Loss of revenue from hunting and fishing is not mentioned.

The full projected benefits and the 100 year life of the project will not be realized unless flood plain zoning and runoff control are an integral part of the plan. No justification of the 100 year project life is made in the statement.

The statement could benefit from the inclusion of some tables to summarize project figures and to assist reader understanding. An example follows:

Item (unit)	Quantity	Relationship To			Total Project
		Land Treatment	Structural Measures		
and treatment measures (dollars)	742,600	100 %	91.2 %		47.7 %
Structural measures (dollars)	814,236	109.6 %	100 %		52.3 %
Total Project (dollars)	1,556,836	209.6 %	191.2 %		100 %
Watershed size (acres)	56,429	13.16 \$/acre	14.43 \$/acre		27.59 \$/acre
100 year flood plain (acres)	2,658	279.38 \$/acre	306.33 \$/acre		585.70 \$/acre
landowners in watershed	450	1,650.22 \$/owner	1,809.41 \$/owner		3,459.64 \$/owner
Directly benefited landowners	48	15,470.83 \$/owner	16,963.25 \$/owner		32,434.08 \$/owner
Watershed SCS Cooperators	166	4,473.49 \$/cooperator	4,905.04 \$/cooperator		9,378.53 \$/cooperator
Structural measures length (feet)	67,300	11.03 \$/ft	12.10 \$/ft		23.13 \$/ft
Project life (years)	100	7,426.00 \$/year	8,142.36 \$/year		15,568.36 \$/year
Major floods in project life	350	2,121.71 \$/flood	2,326.89 \$/flood		4,448.10 \$/flood
Minor floods in Project life	295	2,517.29 \$/flood	2,760.12 \$/flood		5,277.41 \$/flood
Cropping season major floods in project life	185	4,014.05 \$/flood	4,401.28 \$/flood		8,415.33 \$/flood
Cropping season minor floods in project life	110	6,750.91 \$/flood	7,402.15 \$/flood		14,153.05 \$/flood

Note: While all values on the table are not meaningful, many of them are helpful in project evaluation. For instance, the land treatment measures cost per cooperator is \$4,473.49 which is to be spread over 5 years or which amounts to \$894.70 per year on the average for 5 years.

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The undesirable features of the project are the result of the structural measures. The land treatment measures are desirable and should be pursued.

In conclusion, the statement is found to be inadequate in many ways and certainly doesn't come up to the full disclosure requirements being applied in the courts today.



BRADLEY, ARANT, ROSE & WHITE
1500 Brown-Marx Building
Birmingham, Alabama 35203

March 29, 1973

Mr. W. B. Lingle, State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 311
Auburn, Alabama 36830

Re: Swan Creek Watershed Project
Limestone County, Alabama

Dear Mr. Lingle:

Thank you very much for your letter enclosing the draft environmental impact statement ("the Statement") for the above watershed project. We are pleased to submit our comments for your consideration and for inclusion in the final environmental statement. However, although the draft covers 19 pages, it does not appear to set forth all necessary information required by the National Environmental Policy Act of 1969 (42 USCA 4321 et seq.) ("NEPA") so as to permit the President, the Council on Environmental Quality ("CEQ") and the public to make an intelligent appraisal as to whether this project is desirable or not and, in addition, it appears to misstate certain known consequences of channelization of a stream. Consequently, we regret that our comments are not favorable. We, nevertheless, wish to commend the SCS for the land treatment measures proposed in the project area as well as those undertaken elsewhere; and we feel that such measures, together with other procedures not requiring as much expense or resulting in environmental damage, would provide an alternative to the channelization of Swan Creek that would be much more desirable both from a fiscal and an environmental standpoint.

Our comments are as follows:

(1) Failure to Obtain or Set Forth Adverse Comments and Views of National Water Commission.

Section 102(2)(C) of NEPA requires that the agency involved consult with and obtain the comments of any federal agency which has special expertise in the matter involved. The National Water Commission was created by Congress to make recommendations on water resource policy to Congress and the President; however, it has not been asked to comment on the

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in the "detailed statement" required under NEPA, we understand it is the unrealistic historical rate of 3-1/4%; and the project life used in the calculations appears to be the long period of 100 years, as appears in the third paragraph under Item 6 on page 17 at the end of the Statement. Why a project life of 100 years is used when the current life recommended by the Water Resources Council is only 50 years is not adequately explained. Apparently this life is based on an assumption of "adequate maintenance"; but some supporting information should be included because maintenance on other PL-566 projects has proved to be inadequate and, upon inspection, channels have had to be redredged to remove silt and other measures taken (see below under "Maintenance").

The discount rate is also an historical accident. The present rate recommended by the National Water Commission is 5-1/2% while the Water Resources Council in its recently proposed standards recommends a 7% rate. Further, we understand that leading government and private economists have determined the true cost of capital now to be between 8% and 10%. A higher discount rate should, therefore, be used in order to justify the expenditure of needed public funds on a project of this nature, particularly since there is such great demand today for public funds for so many purposes. We understand that, when the project was initially planned in 1966, annual flood damages to crops and pastures were estimated at around \$18,000 with total damages at around \$30,000. Now, in the Statement, the damages to crops and pastures has been increased \$30,000 itself with a total damage figure of almost \$50,000 (see top of page 9 of the Statement). If the benefits to accrue from the project are going to be updated, it seems only reasonable that the discount rate be updated also to what is at least current practice in other water resource projects. According to some of the court decisions cited above, disclosure of the effect of such updating is necessary to permit officials and other persons removed from the decisionmaking process to appraise the desirability of the project; in other words, the use of such a low discount rate and such a long project life should be adequately pointed out so such persons can know how the benefit-cost ratio was reached.

(4) Increased Erosion and Siltation.

Although the Statement attempts to limit erosion and siltation to the period of construction (see Para. V of Summary and the listing of adverse environmental effects at the bottom of page 15), this is contrary to basic biological theory. The natural effects of straightening out the stream into a

Mr. W. B. Lingle, State Conservationist
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drainage channel will necessarily accelerate the flow of waters and are intended to do so, and the removal of trees from the banks will naturally deprive them of the root systems necessary to protect them against erosion. Investigations by impartial observers of similar PL-566 projects, including those in Alabama, substantiate the fact of banks slumping, erosion and increased siltation. Revegetation of the banks with grasses or other plants cannot replace the strength of the root systems of trees in holding them against erosion. These are basic scientific results and, consequently, the Statement is deficient in not pointing out these adverse environmental effects that necessarily will follow from a channel project, or at least it should explain what studies and scientific research support limiting erosion and sedimentation to the construction period. As stated by the courts, see National Resources Defense Council v. Grant, 5 ERC 1001 (E.D.N.C. 1973); Calvert Cliffs, supra, one of the requirements of NEPA is that the responsible agency do adequate studies to support its conclusions as to environmental effects of its projects. As a result, when the description of the environmental effects is contrary to basic biological information and contrary to experience on similar projects, the environmental impact statement is inadequate without some further supporting scientific data.

This situation of downstream sedimentation is particularly serious in the case of Swan Creek where a wildlife management area is located at the mouth of the creek and where, in order to preserve the wildlife habitat in the management area, only clearing and snagging of the creek bed is proposed with the avowed intent to protect that area. However, the natural result of downstream sedimentation will be to deposit the increased sediment in the flood plain of the management area and, thus, will have a detrimental effect on the trees being relied upon to preserve the wildlife habitat there and to protect the natural resources of the area. (The fact of continued erosion and siltation is apparently recognized on page 17 of the Statement where the predictions or estimates of the designed life of the project are based on adequate maintenance.)

There appears an inconsistency between Alternative b, on page 16 and the effect of conservation land treatment measures on sedimentation as described in the second and third full paragraphs on page 13. It is there shown that the land treatment measures will result in a 27% reduction in total erosion from the watershed, which is the same percentage reduction in sediment deposited annually at the mouth of Swan Creek and Wheeler Reservoir. Consequently, it is clear that the land

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treatment measures, which are very desirable, will serve to reduce erosion and sedimentation. On the other hand, the channelization will serve to increase them and, thus, work against the benefits anticipated from the other measures, i.e. there would be less sedimentation at the mouth of Swan Creek if only land treatment measures were employed rather than land treatment with channelization. This emphasizes the desirable alternative discussed below of land treatment measures -- together with some clearing by suction pumps or hand labor and perhaps installation of water retarding structures -- as a significant alternative to the proposed channelization project.

(5) Downstream Flooding.

One of the necessary effects of a stream channel project will be to rush floodwaters to downstream areas. Under the plan for the Swan Creek project, these floodwaters will be thrown on the wildlife management area where the bottom width of the stream is to be 40'-60' as opposed to the 90' of channel just above it (see bottom paragraphs on pages 10-11). This will naturally create a flooding condition in that area. Further, to the extent floodwaters are accelerated in their flow to the Tennessee River, it can increase flooding problems even there. As the recent large amount of rainfall has shown, even the capacity of the Tennessee River is not unlimited; and because of inability of the watershed to hold back rainfall, places in the Tennessee Valley were flooded on which the heavy rainfall did not fall directly. (Perhaps this explains why the TVA opposed the "floodway" alternative -- see last paragraph on page 18.)

(6) Apparently Erroneous Flooding Data.

The number and time of year of flooding in the creek's watershed is, of course, cited as a justification for this project, and at the bottom of page 8 is stated that "flooding occurs on the average of four times every year during the cropping season and three times every year during the winter." However, at the top of page 2, it is shown that January is the wettest month in the project area; and it is common knowledge that in North Alabama most flooding occurs during the months of February and March. On the other hand, the growing season is stated, at the top of page 2, as being from April through October. Hence, the data on page 8 appears inconsistent with the generally known weather conditions existing in the watershed. That data was obtained through miscellaneous interviews, so it is possible that somehow the data has been improperly

Mr. W. B. Lingle, State Conservationist
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collected or perhaps the persons interviewed did not readily understand the questions or have adequate information. This should certainly be straightened out before undertaking the financial and environmental costs of a channel project such as this.

(7) Adverse Effects on Woodlands.

Limestone County, as shown by the Statement, is primarily an agricultural region. It is not emphasized, however, that it ranks last in the state in acres of woodlands. Consequently, the loss of any woodlands to the Swan Creek Watershed is more serious than it might be elsewhere. Apparently, over 300 acres of forest land will be cleared for project installation. It is anticipated that much of this will be replanted; however, it is not stated in what type trees it will be replanted, thus being a deficiency in the Statement. It is thought that the composition of the forest will be manipulated to convert hardwood and pine stands to pure pine monoculture, which would have a serious adverse effect on wildlife in the watershed, an effect which is not mentioned. In addition, to the extent that the practice of clearcutting might be employed in a flood plain such as this, the adverse effects of erosion would, according to basic biological data and experience, be accelerated.

(8) Maintenance of Project.

There appear no references in the Statement to the means by which the project, if completed, is to be maintained except that, as stated, adequate maintenance has apparently been assumed. Investigations of other PL-566 projects show that the sponsors of the project have not continued proper maintenance measures, and there is apparently no incentive on them to do so. The Statement, therefore, should point out the problems raised by the necessity for proper maintenance and how this maintenance is to be assured, without which one cannot evaluate the desirability of the project because of being unable to evaluate whether its claimed benefits will be permanent or not.

A similar problem is presented by proposed mitigation measure (4) set forth on page 11 where it is proposed to plant trees "along the spoil, where approved by landowners". However, nowhere is it set forth whether the landowners will actually do this or any means for enforcing that they will; therefore, this mitigation measure is reduced to mere specula-

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tion. (It is also not explained how the channel will be maintained if heavy equipment is needed and trees are planted along the spoil banks; and in the case of other projects, such planting of trees has not occurred.)

(9) Alternative of Floodwater Retarding Structures.

Paragraph 2 of Watersheds Memorandum 108 of the SCS, setting forth guidelines for channel projects, states that such projects are to be "supplementary to floodwater retardation, not an alternative for achieving an adequate level of flood protection." The alternative of floodwater retarding structures, however, is dismissed in Paragraph 5a of the Statement (page 16) on the ground of no available physical sites. Nevertheless, our information is that floodwater impoundment sites are available on the upper reaches of Swan Creek, but installing them would require relocation of either a portion of the L&N Railroad or a highway. In addition, it is the writer's understanding that another site has been available but is occupied by a TVA relay station, which, however, could be relocated. The Statement is, thus, in error in stating that no sites for floodwater retarding structures are available and, in order to be complete and accurate, should state the necessary costs of such relocation so that they might be compared with the costs and environmental damage of a channel project.

(10) Failure to Disclose or Adequately Discuss Other Alternatives to the Project.

While the project contemplates clearing and snagging in the wildlife management area near the mouth of Swan Creek, it appears that similar alternatives have not been considered or adequately discussed for the remainder of the creek. We understand use of suction pumps to remove sediment from the bottom of the stream and, thus, to restore a more natural stream bed without destroying the trees that hold the banks against erosion and provide shade for the stream is considered an adequate construction technique to be used in channel projects. Pursuant to Paragraph 8 of Watersheds Memorandum 108, the least destructive construction techniques are supposed to be used. Therefore, this alternative, which would provide flood control without unnecessary environmental damage, should be considered as an alternative.

A similar alternative would be the use of teams of laborers with hand tools, under supervision of biologists, to remove sediment from the stream and restore the natural stream

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bed as nearly as possible. This alternative also would provide flood control without unnecessary environmental damage, and it would also reduce costs for machinery and provide employment for unskilled laborers in the project area, which the Statement claims as a benefit for the present project.

(11) Erroneous or Misleading Ornithological Data.

At page 14 of the Statement, it is claimed that the project will benefit ground nesting birds such as the Bob-white Quail, Common Nighthawk, Belted Kingfisher and Eastern Meadowlark. It will be seen, however, from the book Alabama Birds, the authoritative text on birds of Alabama, that all four of these species are common residents during their breeding seasons in Alabama; and the writer knows from his personal experience in the Tennessee Valley that these birds are common in that area. It is basic knowledge regarding the habits of birds that just so many species will inhabit a particular area during the nesting season; and for that reason the project would not increase the numbers of these species breeding in the project area since they are already common there without the project. In the case of the Bob-white Quail, it requires hedgerows and similar brushy areas for its nesting habitat, so to the extent the project would cause an increase in pasture lands, its nesting habitat would be diminished. The Belted Kingfisher nests in burrows in banks; consequently, the increased turbidity of the stream and erosion resulting from channelization referred to above would adversely affect its nesting habitat. (This result has been noted in rivers where the current flows at relatively high velocities as opposed the slower velocity in natural streams.) As a consequence, a favorable environmental effect of improving nesting success of ground nesting birds should not be claimed for this project.

(12) Rare and Endangered Species.

At page 6 of the Statement, it is noted that the Tuscumbia Darter is classified as a rare species in Alabama since it is present "in such small numbers that it may be endangered if its environment worsens". As a consequence, because of destruction of natural stream habitat and breeding areas, including increased velocity of water flow and increased siltation from bank erosion, the project would adversely affect the habitat of that species of fish.

(13) Soil Productivity.

It is common knowledge that periodic flooding con-

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tributes to the fertility of bottomlands. The famous Mississippi Delta is a prime example. However, if run-off from the watershed is accelerated, scientific data shows that this will have an adverse effect on soil fertility and eventually will require more fertilizer in order to obtain the same yield per acre. Consequently, this serious adverse effect on farm productivity should be adequately discussed in the Statement.

(14) Probably Illusory Employment Advantages.

The additional employment to result from the project has been stressed (see the first paragraph under "General" on page 14, which is also listed as a favorable "environmental" effect on page 15). However, under the economic description of the area on page 4, it is shown that the population of Athens has substantially increased over the last decade, that there have been rapid increases in employment by developments in the nearby cities of Huntsville and Decatur, and that additional employment will be created by the TVA's Brown's Ferry nuclear plant presently under construction. Consequently, the amount of additional employment created temporarily by this project, which is only estimated, would seem to be absorbed in the larger economic picture of the area and, hence, is not a significant benefit to be derived from the channelization of Swan Creek.

Conclusion.

The many organizations interested in conservation of Alabama's natural resources and our taxpayers concerned with effective utilization of our tax dollars join me in urging that you adopt, as an alternative, a program of land treatment measures, water retarding structures, and suction pumping or teams of hand laborers to remove siltation from Swan Creek. This alternative would be most desirable in lieu of the financial expenditure and environmental losses entailed by channelization of the creek. We appreciate the opportunity to submit these comments and, in compliance with Paragraph 10 of the CEQ guidelines, are sending ten copies (one signed and the other nine conformed) to the CEQ and an additional ten such copies to you for your convenience in including them with the final environmental impact statement. Your consideration of the above matters will certainly be appreciated.

Sincerely yours,

Robert R. Reid, Jr.
s/ Robert R. Reid, Jr.
Robert R. Reid, Jr.

Route 10, Box 23
Athens, Alabama 35611

March 29, 1973

Mr. W. B. Lingle
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

Enclosed please find our comments on the Draft Environmental Statement for the Swan Creek Project, Limestone County, Alabama. We will appreciate inclusion of these comments in the final statement.

We will also appreciate a copy of the final environmental statement.

Sincerely,

Citizens to Save Swan Creek

William A. Short
John C. Russell III
Robert W. Cady, Jr.

Enclosure

cc: Senator Sparkman
Senator Allen
Congressman Jones
Judge James Newby
Environmental Protection Agency

John C. Russell III

Ronald C. McHaff

1. A TVA flood plain survey on Town Creek (a Swan Creek tributary) did not recommend channelization of Swan Creek.
2. Population incroachment into the Swan Creek floodplain can not be used as rational for channelization. (see Watershed Memorandum - 108, U.S. Department of Agriculture, SCS, Item #5).
3. Channelization can not be used to bring new land into agricultural production. "Restoration of former productivity may constitute bringing new land into agricultural production", (see Watershed Memorandum - 108, U. S. Department of Agriculture, SCS, Item #4).
4. A determination by us of fish species found in Swan Creek in a 1484 foot section running south to highway 72 during the summer of 1972 disclosed the following species: rock bass, black bullhead, common sucker, watermouth bass, carp, gizzard shad, sand picheral, grass pickeral, black-banded topminnow, hog sucker, blunt nose minnow, large mouth bass, green sunfish, orange spotted sunfish, bluegill, redear sunfish, longer sunfish, grassy minnow, old horse sucker, golden shiner, common shiner, and silver shiner. There seems to be no such survey made by the project sponsors. A complete ecological survey of the entire Swan Creek flood plain most certainly be a requirement for a meaningful impact statement.
5. The data "Hunting Effort 1970-71" and "Trapping Effort 1970-71" is not valid for the purposes intended since the data are "combined data for Swan Creek Wildlife Management Area and nearby Mallard-Fox Creek Wildlife Management Area". The Mallard-Fox Creek Wildlife Management Area lies accross Wheeler Lake impoundment a distance of about 1 miles.
6. Flood water damage on Town Creek tributary is reported to be in areas which are at distances of approximately $1\frac{1}{2}$ miles to 3 miles from the Town Creek outlet at Swan Creek.

Elevations on Town Creek, range from 730 feet at the source to 640 feet at the mouth, a drop of approximately 90 feet over the six mile course. Calculation shows that the drop is therefore about 15 feet per mile. One and one half miles back from the mouth is then about 22 feet above the base level at the mouth. Town Creek has probably never been 22 feet above normal flow level. If channelization helps then Town Creek should not flood since it has been channeled. Furthermore, if flooding at the Town Creek-Swan Creek confluence causes flooding $1\frac{1}{2}$ miles back (or 22 feet above base flow) then the Tennessee River impoundment in Wheeler reservoirs should cause flooding of the entire North Alabama region.

7. References such as "flood waters causing a high expense for road maintainance and a safety hazard to motorists.", and "reduced expenditures for road and bridge maintainance, will have an effect of providing more money for better health care, better diets and a higher stand of living." must be referenced to Table 5 of the "Watershed Work Plan" which states that Swan Creek causes an estimated average annual damage of \$490.00.
8. The statement "less delay at harvest time" given as a rational for channelization to increase farm net profits must certainly be countered by "Dry conditions prevail from midsummer to late fall".
9. "With flood protection and a resulting increase in incomes it is expected that some farmers within the watershed will be able to stay in business" is an interesting statement since one farmer in the watershed recently received government crop subsidies amounting to several tens of thousands of dollars.
10. The Draft Environmental Statements also states that "The water quality of Swan Creek, below its confluence with Town Creek, is very poor because of pollution from

the City of Athens." No one denies this fact, however, in the condemnation proceedings against one farmer this issue was not allowed as evidence because the City of Athens is in the process of correcting at least its ~~(scattered)~~ problem. It might also be argued that channelization of Swan Creek offers no correction of the pollution problem except to hurry it away from Athens and into the recreational waters at the Wheeler Reservoir.

11. If the "modified channel" is to be 90 feet wide in the lower reach, how then will a channel 40 to 60 feet wide, cleared and snagged, in the Swan Creek Wildlife Management Area, into which the 90 foot channel flows be adequate?

12. "Flood plain zoning by the local people for land use will be encouraged". A TVA flood plain survey of Limestone County made more than ten years ago is to this day being ignored by "the local people". This area is not now certified to receive flood insurance. Construction is now being carried out on the Town Creek banks for a new shopping center. It was indeed, construction work on a Town Creek bridge which may have contributed to the most recent flooding of Crutcher Shopping Center which is also on the banks of Town Creek.

13. Some "Favorable Environmental Effects" attributable to channelization are as follows:

a. "Reduce erosion and sedimentation". Certainly true for land treated uplands but for increased row crop agriculture in the flood plain it can not be true.

b. "Improve the hydrologic condition of forest soils." This statement can not be taken seriously even if the 222 acres to be cleared and replanted would be replanted, and if it would be replanted in other than monoculture and if replanted forest could be shown to be as efficient as natural forest for this purpose.

14. "There are no known archaeological or scientific sites of value". Bulldozers and drag lines are not the tools of the archaeologist. Limestone County is, in fact, rich in Indian artifacts.

15. It is stated that 78 acres of land will be dedicated to the modified channel. Using the figures of 12.5 miles of channel, 35 foot channel width at the head and 90 foot channel width at the lower reach, 520 feet per mile and 43,560 square feet per acre a simple calculation shows that the channel will require 95 acres. The difference between 78 and 95 amounts to more than a 21% error. If there is that much error in a simple calculation, how much error must there be in estimated figures and calculations based upon estimated figures?

15. Aesthetic values have been considered only insofar as the forest are concerned. It is a fact that several home owners along Swan Creek built or bought homes because of the aesthetic appeal of the creek. Are these people, who own \$30,000 homes be ignored? Do they not also contribute to the tax base?

16. There are many more statements that might be criticized on logical and factual basis. These points should certainly suffice to show the inaccuracy of the Draft Environmental Statement and the fallacy of the project.

March 24, 1973

Limestone County Soil and Water Conservation District
James M. Newby, Chairman
Route 1
Athens, Alabama 35612

Dear Mr. Newby:

Attached is the statement of the Chattahoochee Chapter of the Sierra Club on the proposed modification to Swan Creek in Limestone County, Alabama.

The fraction of our lands that still retain a high natural value is low and decreasing. The situation that exists supports the need to restore large areas of impaired land and avoid degrading high quality lands that remain.

The S.C.C. has a strong environmental responsibility and they among many organizations must more resolutely address their responsibilities of protecting the environment on which we all depend.

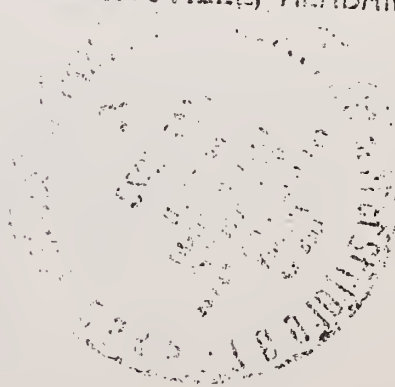
I will very much appreciate a copy of the final environmental statement on the noted project.

Sincerely

Lyle A. Taylor, Conservation
Chairman-Chattahoochee
Chapter, Sierra Club

CC: Soil Conservation Service-Auburn, Alabama
Honorable James Allen

3301 HELENA DR. N.W.
HUNTSVILLE, ALABAMA 35890



Statement on
Draft Environmental Statement
Swan Creek Watershed , Limestone County , Alabama

By
Lyle A. Tylor

Conservation Chairman-Chattahoochee Chapter
Sierra Club

March 24, 1973



Comments on Summary Sheet

V The statement-"Some Fish and Wildlife habitat will be adversely affected by increased stream turbidity and sedimentation during construction." is misleading. This assertion is based on the notion that one is led to assume that the project will not permanently adversely affect wildlife habitat as it will most decidedly do.

VI In a broad sense the alternatives are complete. They are more complete than the set of 1. Do Something 2. Do Nothing. They are relatively meaningless as the relative merits of these and other plausible alternatives has not been shown to have been evaluated.

VII Failure to provide the statement to the Department of Conservation and Natural Resources-State of Alabama is a significant oversight. This organization should be invited to comment.

It is further suggested that the U.S. Congressman in whose district the project will be accomplished should also receive a copy of the draft environmental impact statement as should leading citizen participation conservation organizations active in this region.

Comments on main statement body

Purpose of Project

The purpose of the project seems inherently aimed at accomplishing changed land use. This concept should therefore be incorporated in the purpose. Conservation as used will mislead many who tend to look more altruistically at the conceptual notion of conservation than does the S.C.F.

Project Measures

At least a reference to the definitive measures planned should be included.

Environmental Setting

General- In the main this is a commendable section

Archaeological and Historical Values and Unique Scenic Areas

Is it intended to provide required time for study and retrieval of artifacts? The accommodation of the noted functions is supported. However the extent of support should be stated.

Soil Water, and Plant Management Status

To fully appreciate the requirement for the planned measures an understanding of past land management practices in the watershed must be known. A reference to a work documenting these practices is a minimum requirement.

Fish and Wildlife

The need for planned management of both fish and wildlife is neither acc-

ented not rejected. However the failure to note that the quality of effluent entering the stream must be made compatible with the natural quality of the water is a severe shortcoming.

Planned Project

Some element of definition of the planned measures are given here but the depth of understanding developed is minimal. Are there any other significant non point sources of pollution that should be addressed? Is it planned to regulate agricultural application of pesticides, herbicides and fertilizers?

The comments on page No. 11 in regard to spreading the spoil and sloping it away from the channel is accepted as stating all runoff is to be directed to the stream. This inference is drawn from the earlier statement that indicating the need to avoid supporting mosquito populations. The desirability of limiting mosquito populations is not addressed but it is suggested that stream flow augmentation from ground water sources is preferable.

Again on page No. 11 the notation that the landowners permission is required to plant trees that may be essential to protection of stream values is alarming. Bureaucratic ramrodding of tree planting might well be at least as bad and probably worse but a middle of the road approach where an expert prepared plan with public hearings to moderate the respective public and private interests is suggested.

(1) on page No. 11 seems incomplete. The stream should not be thought of as a sediment trap or sediment accomodator although it may be either or both. If sedimentation is a problem this impact must be slowed by measures designed to hold the soil in place.

(3) on page No. 11 is commendable. Our wildlife populations must be accorded improved treatment.

(5) is questionable at best. If the stream has fish they are undoubtedly adapted to the stream regime that has prevailed in historic times. The deepening of the centerline neighborhood will have hydraulic consequences that may be good or bad but the net result is a modification of an assumed stable system. Stable is used in reference to natural systems and may not be applicable if man is not an element of the natural system or is acting as an agent of upset that can not be accomodated by adjustment rates of the natural system.

(7) Page No. 11 is accepted as good but what is the criteria used in making the decision?

The paragraph at the top of page no. 12 qualitatively answers questions raised earlier but without at least qualifying proper little beyond problem recognition is accomplished.

Environmental Impact

The previous section gives the estimated project cost as about \$1.5 Million dollars. Invested at simple interest of 5% per annum an annual return of \$75,000.00 will be realized.

This simple interest income is over 2 times the stated annual benefits of \$36,000.00.

Flood plain zoning is recommended as noted. That residential and commercial developments in the flood plain are to be discouraged is laudable but the mechanism must be more fully described before meaningful comment can be made.

The shift in land use estimated to occur due to the project must be carefully evaluated. To what extent does the changed land use predicted to occur increase run off and erosion and thus stand in support of channelization?

Assuming that the estimated 27% reduction in total erosion from the watershed will be achieved certainly shows some improvement. However the 80 thousand tons of soil estimated to be lost after channelization is still substantial. This fact supports the contention that in terms of soil retention the project is of little consequence.

Recommendations and Conclusions

Recommendations

The project should be foregone until such time as an Alabama land use plan is developed that will consider all alternatives.

Conclusions

SCS can improve the quality of environmental impact statements by developing a general plan for each situation. Personnel with expertise in surface, subsurface, transport phenomena, ecological systems, biological aspects, zoological considerations and botanical factors must be employed.

The proposed plan for channel modification does not show a logical basis for being performed.

A significant failure of the subject statement is to achieve full disclosure of impacts.





February 5, 1973

Mr. W. B. Lingle
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

The following comments concern the proposed Swan Creek Watershed in Limestone County Alabama. Please consider these comments in preparing the final environmental statement and attach them to the final statement.

The draft statement dated January 1973 includes the usual misinformation and slanted studies generally included to justify channelization projects. This information has been debunked publicly by so many eminent authorities on the subject that it would be ridiculous for me to waste time and paper going over this again. The facts are well known to the Soil Conservation Service which generally chooses to ignore them.

Instead I prefer to devote my comments to the economics of the proposed project. According to the SCS study this project shows a benefit cost ratio of 1.4:1. This is a very shaky ratio which would very probably show negative benefits if redone using realistic discount and interest figures and realistic benefit figures. But the matter that most upsets me and thousands of other taxpayers is that the cost is to be payed by the US taxpayer in general, the benefits (such as they are) mostly go into the pockets of a limited number of local people and in particular into the pockets of certain construction companies and developers. I will personally be in favor of

Mr. W. B. Lingle
Page -2-
February 5, 1973

any channelization project (environmental damage notwithstanding) which is planned to be payed for entirely by the local beneficiaries with realistic interest rates on money loaned for this purpose. Under such an arrangement with the funds to be loaned by private financial institutions we would soon find out what the real cost-benefit ratio would be.

On pages 16 & 17 of the draft environmental statement several alternatives were presented. It is astonishing to note that the entire flood plain could be purchased for very little more than the cost of the proposed "improvements." If the project has cost over-runs (as many such projects do) the cost of purchasing the entire flood plain might very well be less than the cost of the project. However purchasing the entire flood plain would obviously be unnecessary in order to completely eliminate flood damage, because forest land presently occupies 32 percent of the flood plain. Thus you could totally eliminate flood damage by purchasing only 68% of the land.

But there is an even better and unmentioned alternative. By investing the proposed cost of the project at only 4½% per annum you could pay for all flood damage with the interest alone and still have left over a sum greater than the net anticipated average annual benefits of the project. These surplus benefits would accrue to taxpayers in general rather than to a few local promoters.

As an American taxpayer I am personally fed up with the wasting of tax moneys on pork barrel projects such as this. I am also opposed to the obvious and serious environmental damage caused by channelization projects.

Sincerely yours,


Bob Truett

FBT/lh

3451 Flintshire Drive
Birmingham, Alabama 35226
March 30, 1973

Mr. W. B. Lingle, State Conservationist
Soil Conservation Service
United States Department of Agriculture
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

I have reviewed the draft environmental statement for the Swan Creek Watershed, Limestone County, Alabama along with the related watershed work plan. Set forth herein are my comments.

Reduction of flood damage has been "measured" as well as certain other "benefits" of the project but no attempt has been made to assign a cost to the adverse effects of the project. This is like preparing a balance sheet on which you enumerate the assets but stop short of enumerating the liabilities and merely say "there are some". Until costs are assigned to such things as destruction of fish and wildlife habitat, destruction of hardwood forest and effect on endangered or rare vertebrate species, no project of this type should be initiated.

If costs can be assigned to the nebulous "benefits" of the project they can also be assigned to the adverse effects. Further, when cost is assigned to the adverse environmental effects, the project's already questionable benefit/cost ratio becomes much less attractive.

The formula to determine the value of the project should be:

- A - Adverse effects of project
- B - Benefits of project
- C - Cost of project
- V - Net value of project

Therefore: $V = \frac{B - A}{C}$ (expressed as a ratio)

This approach would yield a much more meaningful ratio than the 1.4 to 1 presently reported in Appendix A of the Draft Environmental Statement.

Another aspect to consider is that a piecemeal evaluation involving one project is not enough. What is the overall adverse environmental effect of all such projects taken as a whole? If you drill one tiny hole in a big boat there won't be much effect but if someone else is also in the process of drilling a hundred other holes, then this is a fact to be considered.

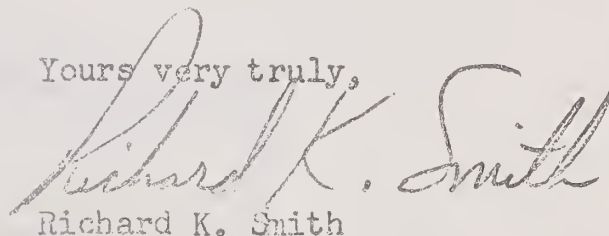
Mr. W. B. Lingle - March 30, 1973 - Page 2

Alleged flood damage figures are stated at three different amounts in the work plan and in the environmental statement. These figures should be consistent throughout or there should be some explanation of differences.

Please give the comments mentioned above your serious consideration.

Thank you.

Yours very truly,

A handwritten signature in cursive script that reads "Richard K. Smith". The signature is written in dark ink and is positioned above the printed name.

Richard K. Smith

PROJECT MAP
SWAN CREEK WATERSHED
WITHIN
LIMESTONE COUNTY
ALABAMA

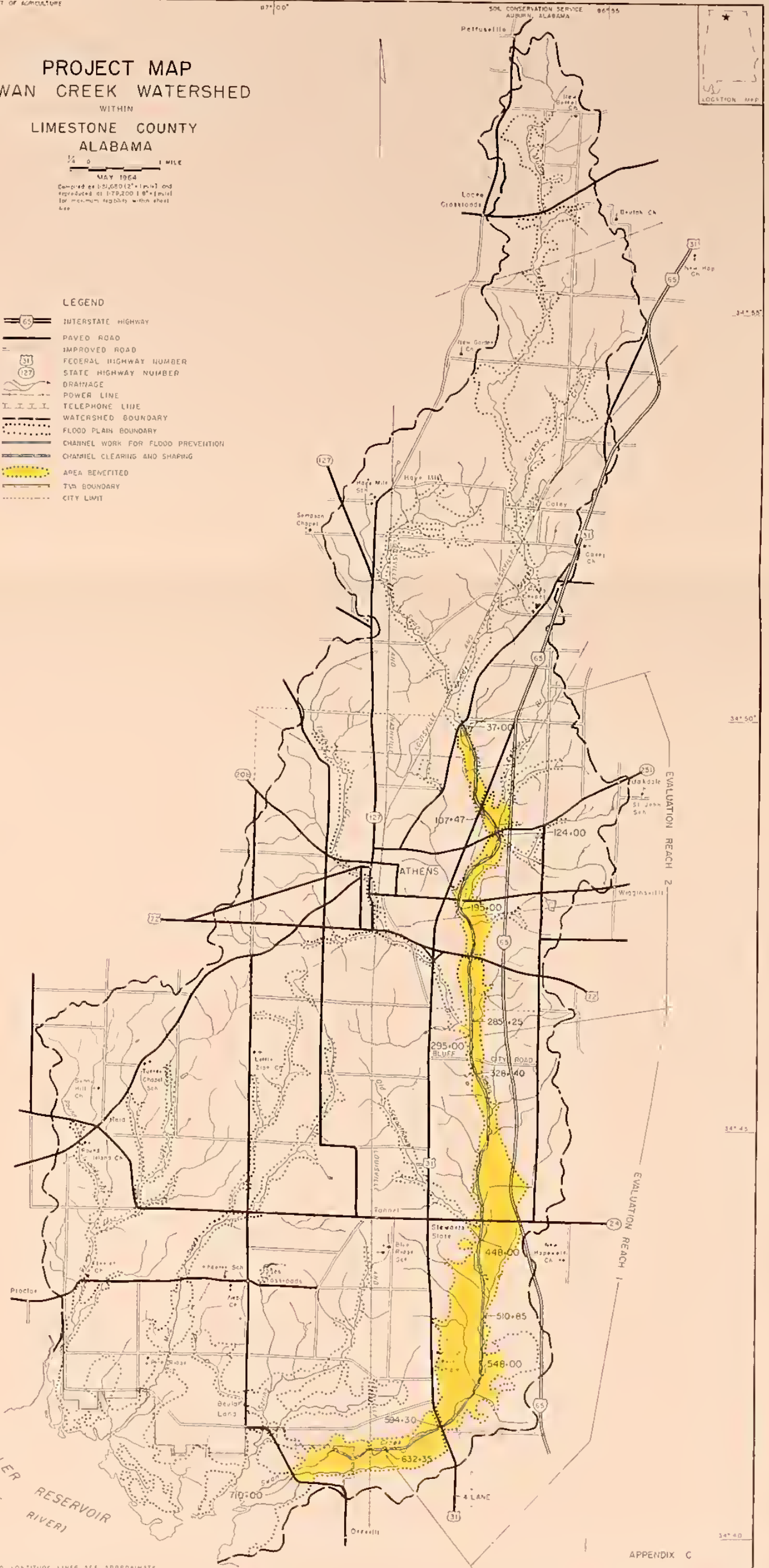
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LEGEND

- INTERSTATE HIGHWAY
- PAVED ROAD
- IMPROVED ROAD
- FEDERAL HIGHWAY NUMBER
- STATE HIGHWAY NUMBER
- DRAINAGE
- POWER LINE
- TELEPHONE LINE
- WATERSHED BOUNDARY
- FLOOD PLAIN BOUNDARY
- CHANNEL WORK FOR FLOOD PREVENTION
- CHANNEL CLEARING AND SHAPING
- AREA BENEFITED
- TVA BOUNDARY
- CITY LIMIT



LATITUDE AND LONGITUDE LINES ARE APPROXIMATE

APPENDIX D

STRUCTURE DATA - CHANNEL

Swan Creek Watershed

Stations	Drainage Area (sq.mi.)	Channel		Capacity Designed (cfs)	Mannings "n" aged	Depth (ft.)	Bottom Width (ft.)	Slope (ft./ft.)	Aged Velocity (ft./sec.)
		Planned (cfs)	to be done in this reach						
33+11	21.7	923	943	.035	4.1	35	0.0028	4.86	
84+00	No work to be done in this reach	923	943	.035	4.1	35	0.0025	4.86	
100+00	21.7	1121	1122	.035	4.0	45	0.0028	4.92	
122+00	26.1	1121	1058	.035	3.2	60	0.0032	4.75	
148+00	26.1	1121	1081	.035	3.4	55	0.0032	4.88	
160+00	26.1	1121	1122	.035	4.0	45	0.0028	4.92	
178+00	31.6	1365	1379	.035	4.1	55	0.0027	5.00	
191+50	31.6	1365	1385	.035	4.2	55	0.0026	4.88	
260+00	31.6	1365	1385	.035	1/	55	Varies		
267+00	31.6	1365	1356	.035	4.2	55	0.0024	4.78	
274+50	46.1	1991	2035	.035	5.0	66	0.0021	5.02	
291+00	46.1	1991	2000	.035	2/	70	Varies		
305+00	46.1	1991	1985	.035	5.0	66	0.002	4.90	
402+50	51.9	2250	2244	.035	5.2	70	0.002	5.04	
446+50	51.9	2250	2273	.035	5.3	75	0.00175	4.77	
470+00	55.0	2393	2372	.035	5.2	80	0.00175	4.77	
547+00	55.0	2393	2393	.035	5.3	90	0.001253/	4.50	
628+00	55.0	2393	Clearing and shaping reach	.035					
658+65	55.0	2393							
658+654/	55.0	2393							

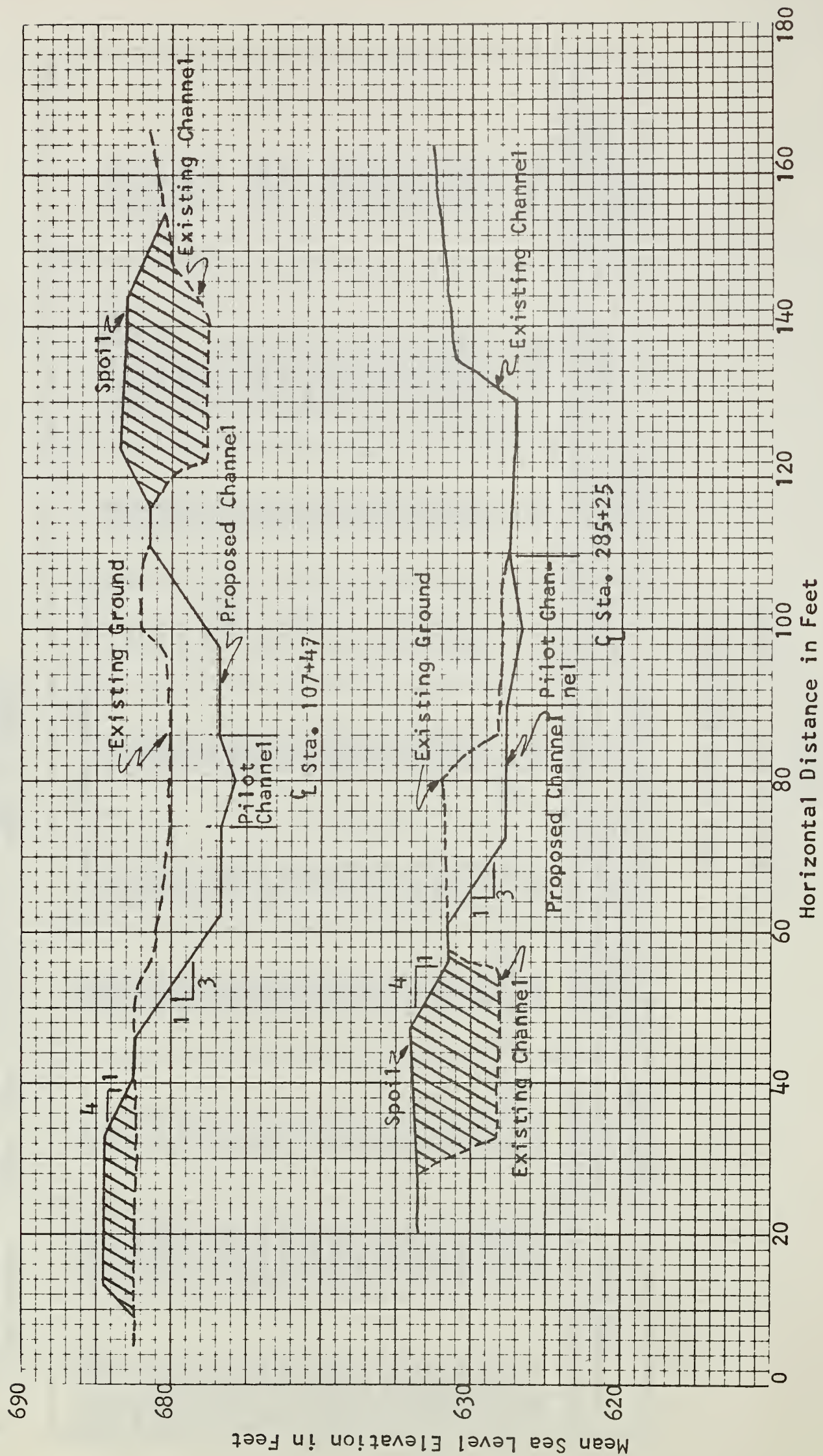
1/ Slope varies - Depth from 4.0 to 4.5 ft. - Rock at grade

2/ Slope varies - Depth from 4.2 to 5.9 ft. - Rock at grade

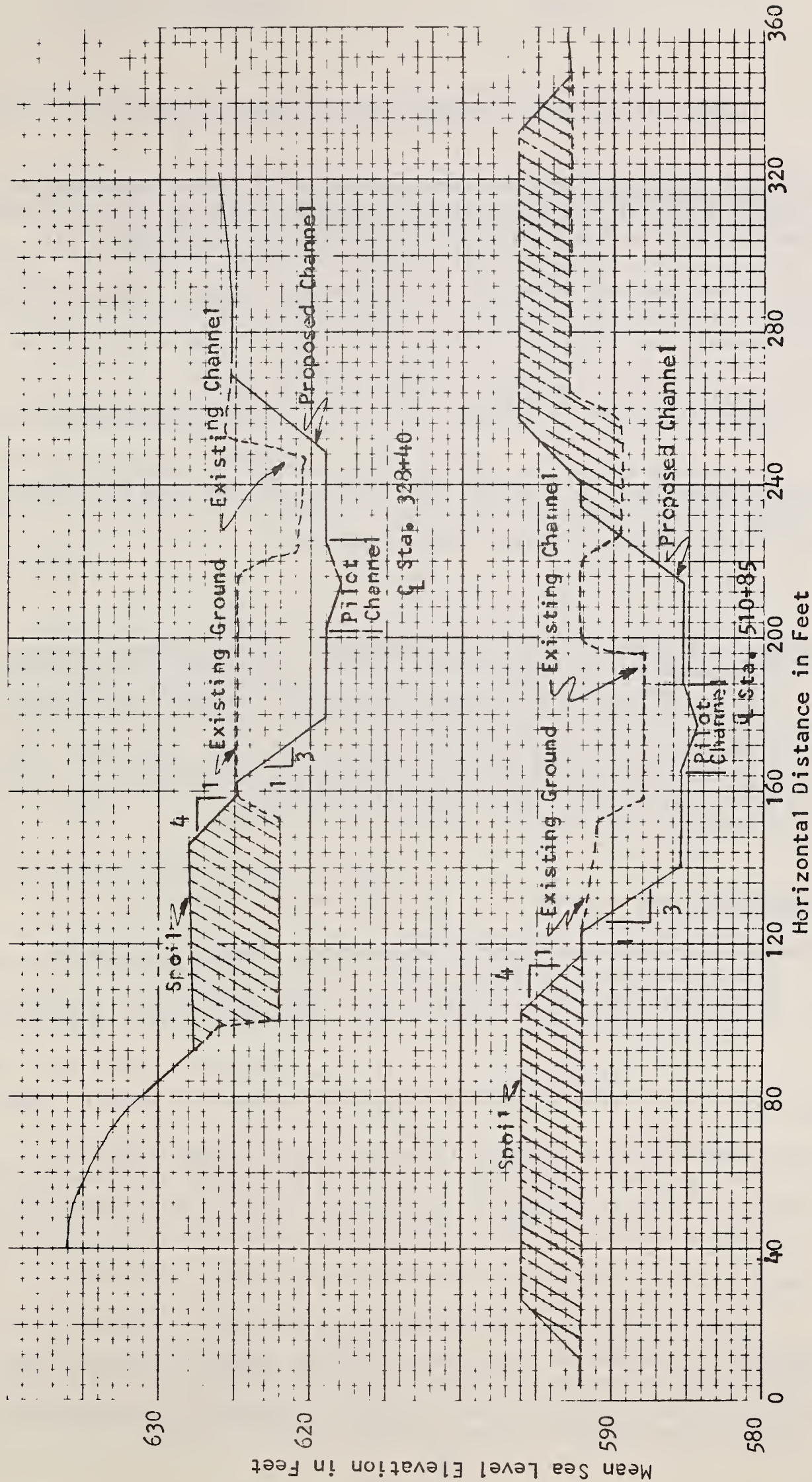
3/ Slope = Channel bottom slope.

4/ TVA boundary - No excavation in this reach

NOTE: All side slopes are 3:1



APPENDIX D
TYPICAL CHANNEL SECTIONS



APPENDIX D
TYPICAL CHANNEL SECTIONS

Conservation Land Treatment Measure Descriptions

Conservation Cropping Systems are combinations of cultural and management measures that are very effective in maintaining a good physical condition of the soil and reducing soil and water losses. Conservation cropping systems also include the use of sod crops in the crop rotation systems on soils that are subject to high erosion rates.

Crop Residue Management is leaving crop residues on the land to protect cultivated fields during critical erosion periods.

Field Borders are strips of perennial vegetation at the edges of crop fields. They are effective in trapping sediment, reducing the rate of surface runoff, facilitating more efficient use of farm equipment, and providing good shelter and travel lanes for wildlife.

Grassed Waterways are natural or constructed water outlets that are established in perennial sod-forming vegetation. They provide safe disposal of concentrated runoff water from fields, diversions, terraces, etc.

Terraces are a series of constructed ridges and channels across the land slope with channel grades designed to safely remove runoff water to stable outlets. They are effective in reducing erosion on sloping cropland.

Land Smoothing is defined as the removal of land surface irregularities. This practice is more commonly used to prepare cropland for installation

of terrace systems.

Drainage Field Ditches and Drainage Mains and Laterals are open ditches constructed to designed grades and sizes. Their purpose is to dispose of excessive surface or subsurface water and control ground water levels.

Pasture and Hayland Planting is the establishment or re-establishment of fields to long-term stands of forage plants. The main purpose is to reduce erosion and/or improve the composition of high quality pasture and hay plants.

Pasture and Hayland Management includes the combination of management and cultural measures that results in proper treatment and use of pasture or hayland. Its purpose is to prolong life of desirable forage species, maintain or improve the quality and quantity of forage, protect the soil from erosion, and reduce water losses.

Ponds are water impoundments made by constructing a dam or embankment, or by excavating a pit or "dugout". They are used to provide water for livestock, for fish production, and for wildlife habitat.

Wildlife Upland Habitat Management includes retaining, creating, or managing wildlife habitat other than wetland. This practice includes a variety of management techniques for specific non-game as well as game animals. For example, a natural area containing a variety of trees, shrubs, vines, and other plants that provide food, protective cover, and other needs of the desired wildlife species can be retained and managed.

A few other commonly used techniques are: planting of food plots for the desired wildlife species, retaining of a portion of a normal agricultural crop, and creating of openings in forest land.

The forest land treatment program will consist of reducing wildfires on 11,000 acres by purchasing additional fire fighting equipment and informing the public of the hazards of uncontrolled debris burning. An accelerated technical assistance program will identify the needs and create treatment and management plans for 2,460 acres. Management plans will be directed toward forest resource management for forest products, wildlife habitat, watershed protection, and environmental enhancement.

Tree Planting - Planting specific tree seedlings to specified spacings to establish or reinforce a stand to conserve soil and moisture; beautify an area; protect a watershed; or produce wood crop.

Woodland Improved Harvesting - Harvesting some of the merchantable trees from an immature stand to improve the conditions for forest growth and/or harvesting trees in a manner that encourages the regeneration and normal development of a new stand.

All applied conservation land treatment measures will be maintained by the landuser.

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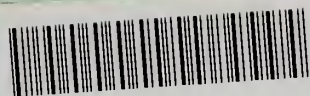
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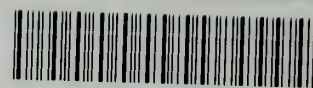
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